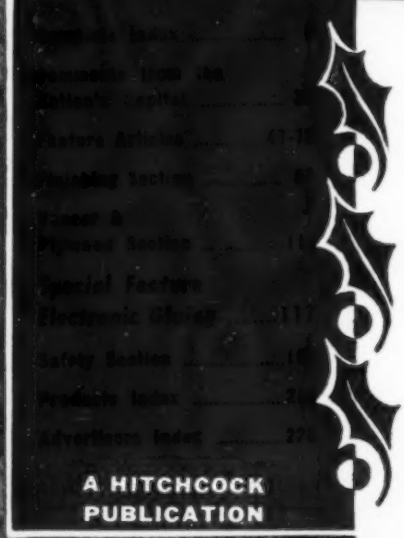
WOOD WORKING digest



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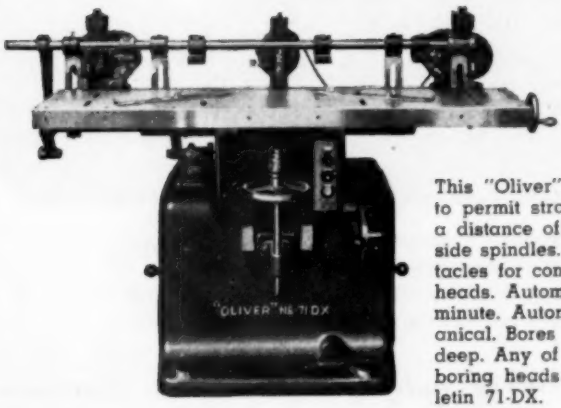
Step up Production... bore 1 to 6 staggered holes at one time on "OLIVER" BORERS

No. 71-D bores 1 to 4 staggered holes . . . increasing production up to 100% a man

Bores up to four holes simultaneously, as close as 7/8", as far apart as 42" between centers of outside spindles. Automatic clamping and feeding — 8 to 22 strokes a minute. Single push button controls all motors. Uses any "Oliver" direct motor driven single or multiple spindle, fixed or adjustable center, boring head. Write for Bulletin 71-D.

"Oliver" No. 71-DX bores 1 to 6 staggered holes in one stroke . . . from 7/8" to 48" between centers



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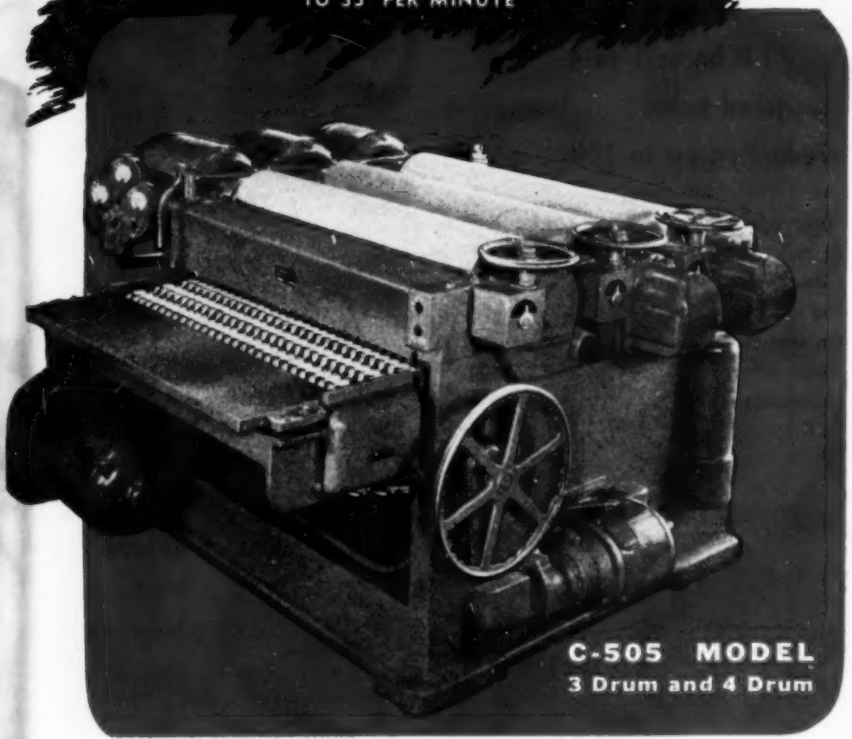

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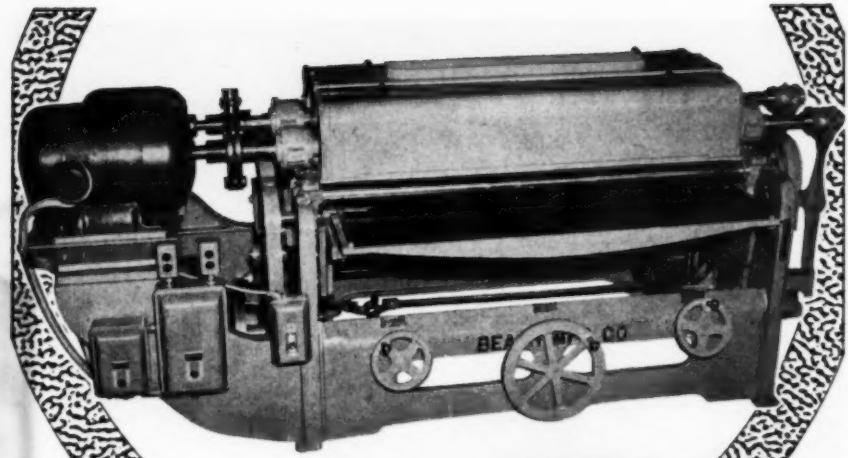

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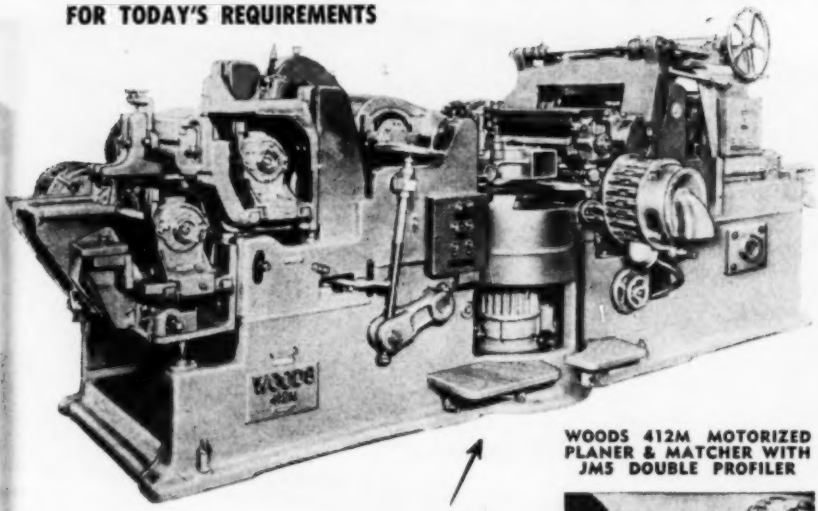

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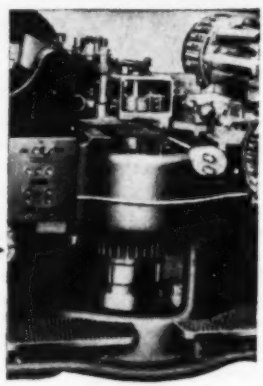

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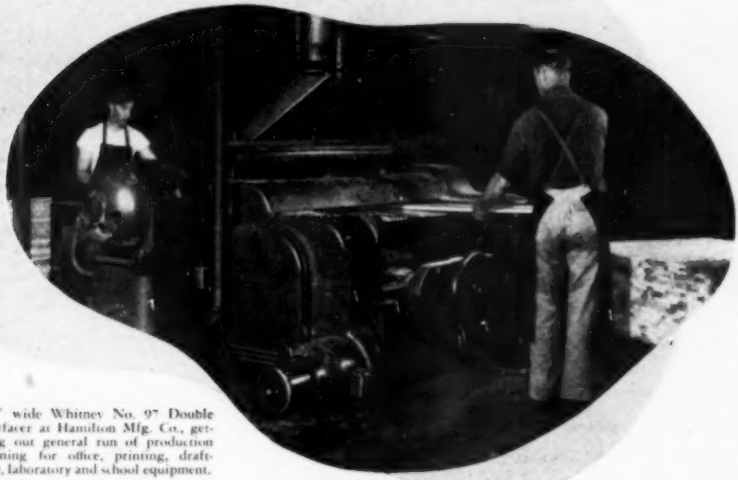

44" wide Whitney No. 97 Double Surfacer at Hamilton Mfg. Co., getting out general run of production planing for office, printing, drafting, laboratory and school equipment.

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Ask for Planer Bulletin D12

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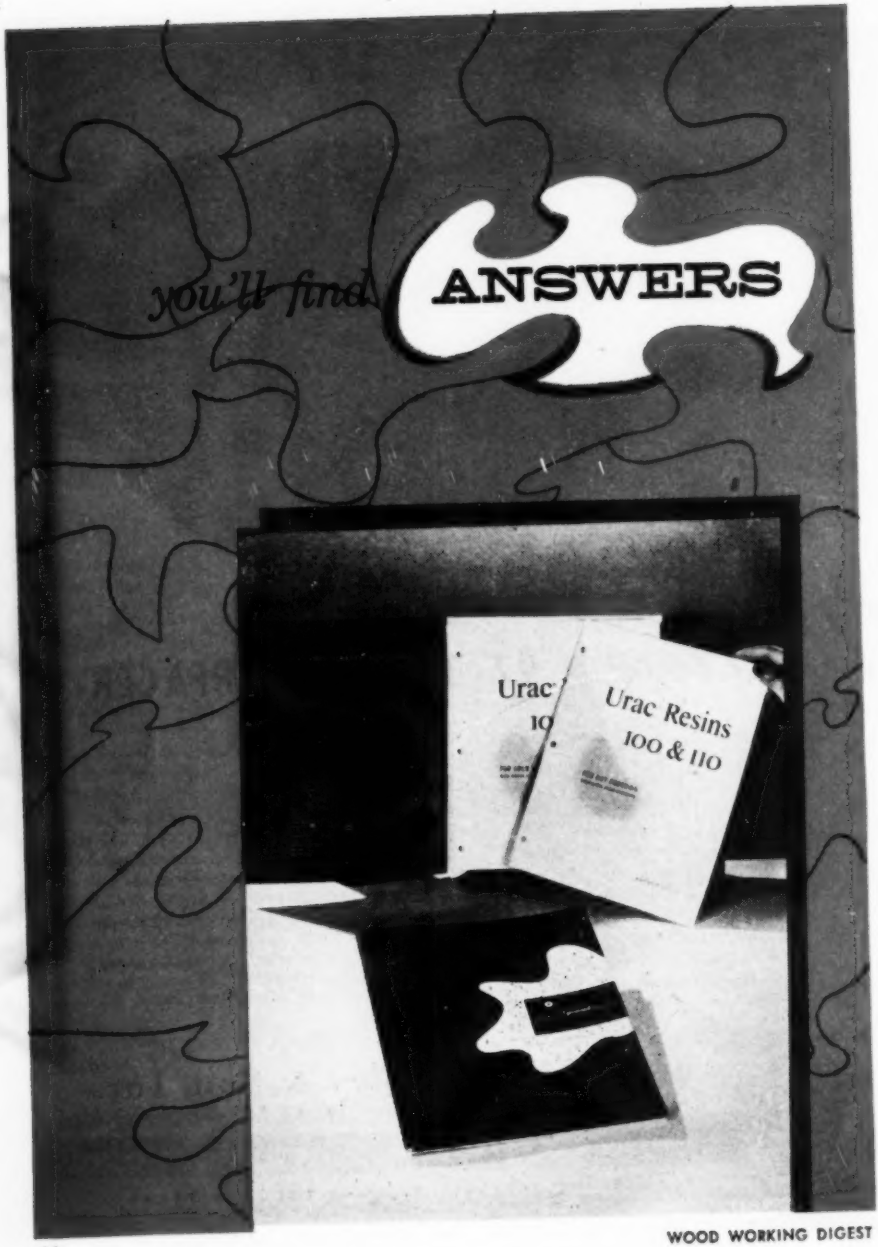
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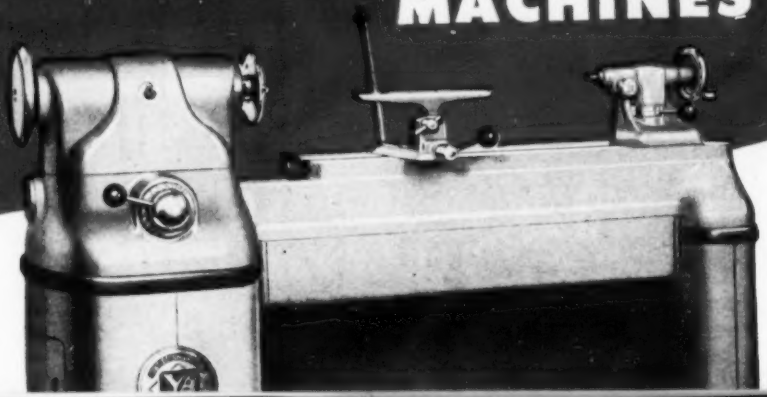
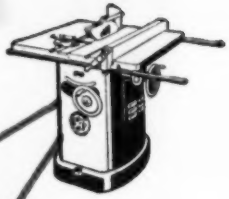
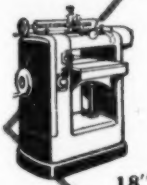




J-120
20" Band Saw

J-170
12" Lathe



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18"x6" Surfacer

J-170 12" LATHE

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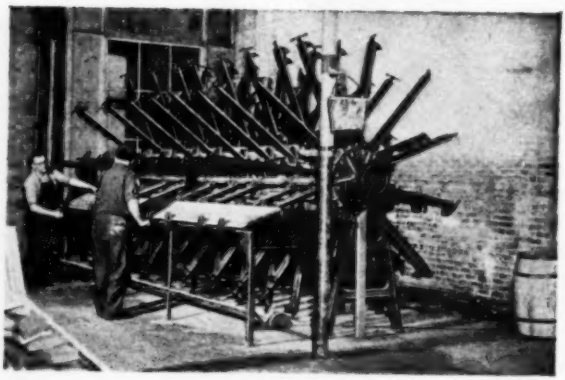

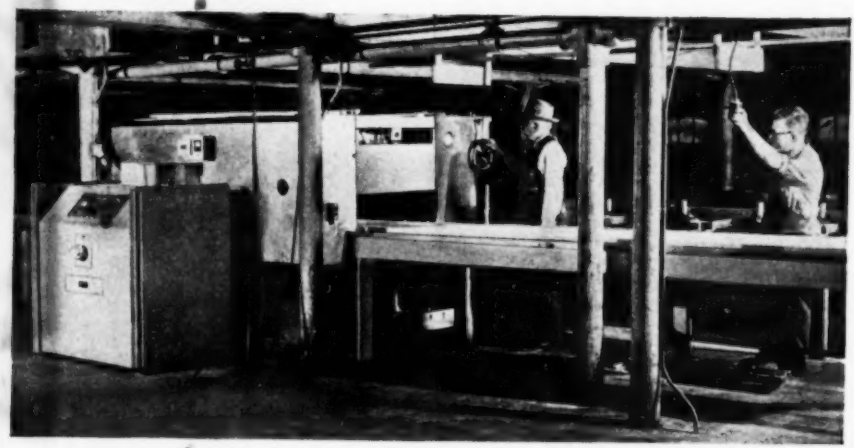

After

Now, using a Westinghouse 10 KW RF Generator in the installation shown here, 2 men working only *part-time* do both gluing operations. Planing and finishing are done immediately after gluing. There are virtually no rejects at all.

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RF HEATING

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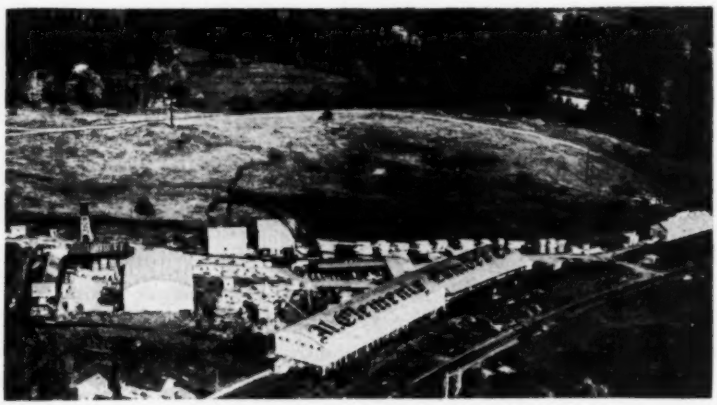

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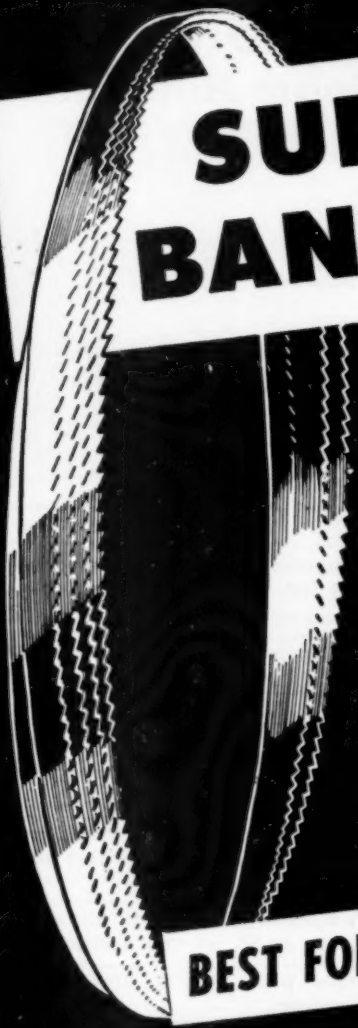

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LOOK FOR THESE FEATURES WHEN YOU ORDER WOOD SCREWS!

PRECISION MILLED SLOT. Milled slots with parallel sides mean safe starting and driving. Other methods of making slots, such as striking the slots when cold heading, result in tapered sides, causing screw driver to slip.

FULL-SIZE SHANK, of equal diameter to threads. Federal Bureau of Standards tested 10,000 individual wood screws in 7 different kinds of wood, concluded full shank has far greater holding power. Full-size shank required by Government Specifications.

THIN, SHARP, CYLINDRICAL, NON-TAPERING THREADS. Cut through wood cleanly, without tearing fibers. Only *cut* threads can provide this sharp cutting feature.

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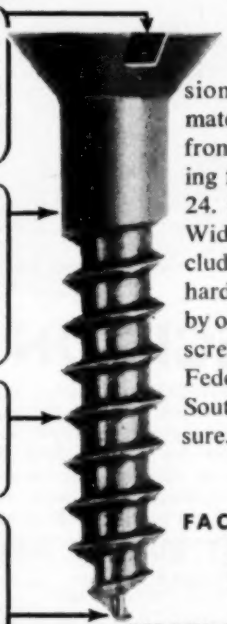

Southern wood screws meet all of these requirements. They're top-quality fasteners, precision-milled from the finest materials. Immediate shipment from large stocks in sizes ranging from ¼" No. 0 to 6" No. 24. Slotted or Phillips heads. Wide variety of finishes, including lubricated screws for hard woods. Don't be misled by over-enthusiastic claims for screws that don't even meet Federal Specifications! Order Southern wood screws and be sure. Write for catalogue today.

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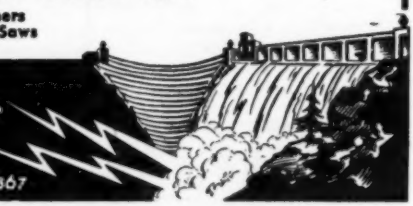

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PUT THE *Profitable Squeeze* ON SASH AND DOORS

Here is a *New* and far better unit . . . it produces either sash or doors, does both more efficiently than ever before. Yet this dual-purpose unit costs less than most old-type equipment which can do but one job!

Speed-Tru Sash and Door Clamp

Air-Powered

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POSITIVE QUICK-CHANGE from 8' x 4' DOORS to 15" x 17" SASH

HANDY makes bending presses, veneer presses and clamping machinery for every purpose. Advanced units shown in our 80-page catalog include:

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Read that name carefully: *Speed*—means faster production, faster set-up by far; *Tru*—means better sash or doors, square and true every time; *Sash and Door* Clamp—means double service, flexibility and double value. And *Handy* means 40 years of building good, dependable machinery.

Expect your No. 453 Sash and Door Clamp to do more work, require less skilled operators, because better engineering has built into it exclusive Center-line Pressure—power is exerted directly on the work in a straight line. Frequent changes from size to size and from sash to door are no problem at all.

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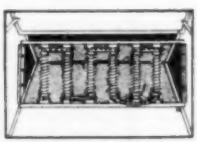
For Bonding, Drying and Baking, Dehydrating, Heat Treating and Pre-Heating.

32 years of specialization serving the Industrial field of operation.



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ATKINS Silver Steel CUTS YOUR FINISHING TIME!

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But even more important, you'll find Atkins cuts your finishing costs. *Silver Steel* designs give straight, true, continually precise cuts. You spend less time in shaping, trimming and planing—thanks to Atkins accuracy!

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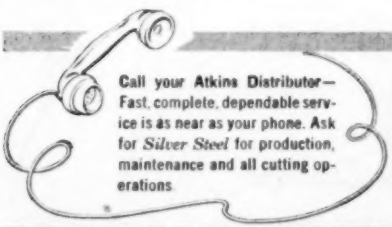

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If you are drum sanding, finish sanding, sanding panels—working on *any* shape or size of stock, there's an Armour abrasive that can help you do a better job for less money.

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1. YOU MAKE A VARIETY OF CUTS—
You rip, bevel rip, plough, groove, rabbet, shape and mould. And you may make many of these cuts at speeds up to 90 feet per minute!

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Moulding, shaping and other jobs can now be performed by one man—instead of the two previously needed. Operator starts the material—end rollers guide it through perfectly.

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Now, as never before, you are completely guarded against kickback accidents. These are prevented by De Walt's special anti-kickback device.

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Power feed operates at three speeds—22½, 45 and 90 feet per minute. Automatic performance takes the guesswork out of cutting...gives you precision results every time.

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Panels glued and cured in 30 seconds!

USING the first fully automatic gluing and layup machine, plus THERMEX* Electronic Bonding Equipment, RWay Furniture Company has more than doubled its production rate of panels...with the same manpower!

The complete operation is on a one-minute cycle, of which heating in the press takes 30 to 40 seconds. Simplified controls permit set-up for different load sizes in less than 5 minutes. The electrical circuit is conveniently set up by a cocking switch at the operator's foot.

Progressive woodworking plants everywhere are reporting faster production, reduced labor cost. Thermex installations are dependable, checked by factory engineers, certified in accordance with FCC regulations.

A Thermex field engineer will gladly study your operations and make recommendations. No obligation. Write The Girdler Corporation, Thermex Division, Louisville 1, Kentucky.

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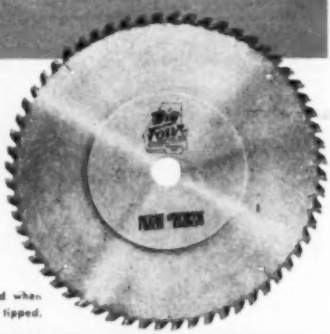
NEW DESIGN SAW BLADE

TYPICAL PRICES

Diameter	Teeth	Price
12"	60	$149.50
14"	60	$153.50
16"	60	$157.50

World's most satisfactory blade for smooth splinter and chip free finished. Especially designed for trimming, mitering and cross cutting fancy veneered panels, ply woods, decorative laminates and solid woods.



Expenses are clipped when it's Big Four Carbide tipped.

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TYPICAL PRICES

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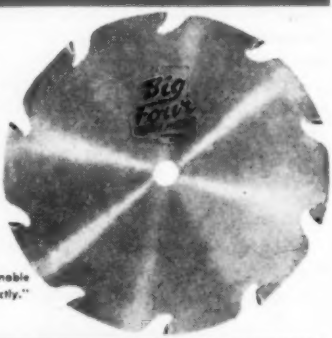
5⅜"	6	$14.40
8"	10	$18.60
10"	10	$24.30
12"	12	$31.00
14"	14	$34.20

Revolutionary in design, performance and PRICE. Anti-kickback features mean less operating effort; carbide tips give longer life. Blades for all sawing operations available 5⅜" to 16" diameters. For portable electric, hand- or chain-fed machines.



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Big 4 produces saw blades for every purpose, from school room manual training to large industrial projects.

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Comments from THE NATION'S CAPITAL

By Arnold Kruckman
Washington Correspondent

Ralph R. Macartney, manager, Klamath Falls Branch, Weyerhaeuser Timber Company, Oregon, is scheduled to be the next president of the National Lumber Manufacturers Association, succeeding John B. Veach, president, Hardwood Corporation of America, Asheville, N. C.

The shift will be the last business of the annual meeting late in November. It's expected that Mr. Veach will move up to become chairman of the board of directors of the NLMA, succeeding Corydon Wagner, vice-president and treasurer of St. Paul & Tacoma Lumber Co., of the state of Washington.

The program for the four-day meeting included an address delivered by President Laurence F. Lee of the U. S. Chamber of Commerce. He called Uncle Sam the world's second largest landlord, inferior only to Russia as landholder. He told the several hundred lumbermen from all parts of the U.S. that the federal government now holds 450,000,000 acres of land, 6% more than it owned 20 years ago. It now possesses approximately 30% of all the land in the U.S., most of which, of course, is timberland.

Mr. Lee suggested that an appropriate agency should make a complete inventory of all federal lands by causing them to be registered in detail; that a joint board be established consisting of representatives of the federal government, state governments, and private owners, to study and report; that an immediate examination of all federal laws concerned with land be made by Congress; and that Congress take steps to compel all federal agencies to suspend land acquisition, except such as is imperatively necessary for military uses.

Many speakers vigorously challenged the report by the President's Materials Policy Commission that there is now, and

will be, an acute scarcity of lumber. Chairman Paley of the Commission recently asserted that it is a problem to know what to do about the additional 1 billion 300 million board feet of primary lumber products which will be needed by 1975.

The lumbermen emphasized that there is a surplus of lumber and there will be a greater surplus. They stressed that in the year ahead people will get more for their money when they buy things made of wood. They made much of the competition from other materials.

At a press conference in Washington's Shoreham Hotel the NLMA unveiled a new all-wood truck body, designed to conserve steel, and to compete with steel truck bodies. The all-wood truck body is intended primarily for military use. It is exceptionally strong, the result of achievements in gluing and bending of wood. Thin strips of black gum are glued in layers and then bent to form U-shaped framing members which run the width of the body. The body has solid side and floor panels, designed to be mass-produced by woodworking plants.

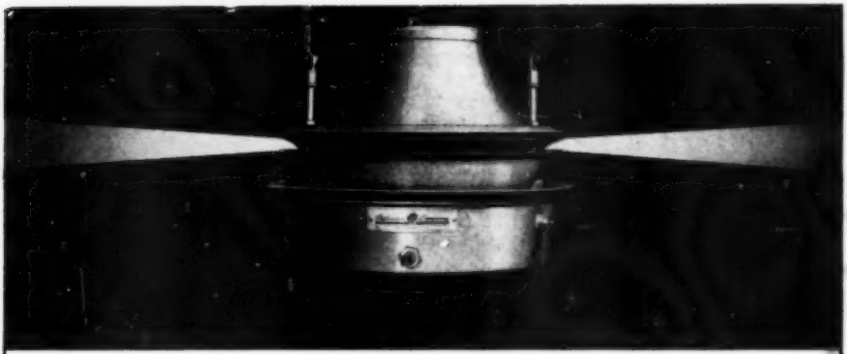
Three all-wood truck bodies will be exhaustively tested at Army's Aberdeen (Md.) Proving Grounds after the holidays. Preservatives have been applied to make decay virtually impossible. Waterproof glues prevent laminated wood from separating in moist tropical areas. The body also is treated to prevent warping.

There has been such a demand from woodworking, furniture and laminating plants, for another course in wood adhesives and glued laminating that another class is being organized by Director Carl A. Rishell, of the Lumber and Woods Products Laboratory of Teco, Washington, D.C. Sixteen classes have been held; a class is limited to 15 enrollees. Applications are received by Timber Engineering Company, 1319 Eighteenth Street, Washington 5, D.C. Teco is an affiliate of NLMA.

Early in December OPS is expected to issue a formula regulation, covering needs of the box shook industry and possibly of the wood box industry. It is expected to parallel the GCPR; whatever is new will "not be world-shaking" according to a member of the industry.

There is persistent gossip that controls may be virtually abandoned by January 1. However, the likelihood is that they will limp along until the end of next March and next June, when they lapse.

NPA expects to be transferred bodily to Department of Commerce by January 1. This is the reorganization which Secretary Sawyer has announced. Those who have come from industry and taken full-time jobs will, if they choose, be absorbed in some part of the Commmerce Department to carry on some type of work such as they have been doing; without, however, the exercise of controls-at least at present. They all



NEW BAHNSON UNIT HUMIDIFIER DEVELOPED FOR WOODWORKING PLANTS

The new Bahnson Type E Humidifier is so low in first cost, so simple to install, and so economical to operate that any woodworking plant can afford adequate humidity control. Type E Units are completely self-contained—do not require pumps, ducts, compressed air, steam or drain lines. Units are suspended from the ceiling, then connected to water and electrical supply. These high-capacity, automatically controlled humidifiers are only 18" in diameter and are operated by fractional-horsepower motors. Single units handle several thousand cubic feet of room volume at average conditions.

Humidity control means moisture content control to the woodworking industry. Winter time is dry air time inside heated buildings—and dry air can rob wood of the moisture it needs for stability during production and use. A reasonable investment in Type E Humidifiers, or Bahnson Type H or L Centrifugal Humidifiers for larger spaces, can mean great savings to wood processors. You can get complete information on humidification and on Bahnson equipment by writing for a copy of our free booklet "HUMIDITY CONTROL IN THE WOODWORKING INDUSTRY."

FOR TRULY DEPENDABLE LOW COST HUMIDIFICATION

Bahnson Company

ENGINEERS AND MANUFACTURERS

WINSTON-SALEM, N. C.

live in hope the Eisenhower administration will see the need of continuous mild controls, and the greater need of maintaining a standby organization for emergency administration of a system of full controls. Meanwhile, it is expected top-level people from industry, who came to supply special services for limited periods, will all be home, permanently, for the holidays.

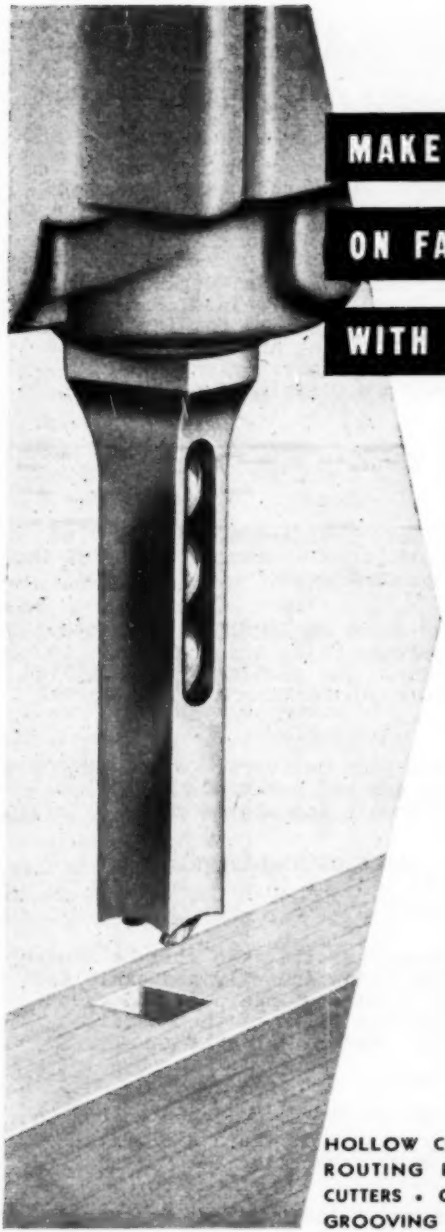
Both OPS and NPA insist that elaborate surveys they made by questionnaires reveal that industry is urging that the Industry Advisory Committees shall be made permanent adjuncts of government. Obviously this would insure some degree of permanency for the emergency agencies. Industry committeemen tell us, however, they do not favor permanent existence, but that they do wish to remain in existence as long as there is a reason for their function.

C. D. Hudson, president of the American Box Shook Export Association, and vice-president of the National Wooden Box Association, both of which head up here, in Washington, has a special reason to be interested in the celebration of the 50th year of human flight which begins in December. Mr. Hudson has apparently substantial records, authenticated and legally corroborated, that some men in New England made power-driven flights a number of years before the Wrights flew.

Officials of the Chemical, Rubber and Forest Products Bureau of NPA—especially those interested in lumber and wood products—are aware that it is assumed the market is soft. They have been telling organizations such as the Association of Manufacturers of Woodworking Machinery what the NPA observers think might be done to improve the situation where it needs a lift. They suggest that the market could be galvanized by a program of modernization. They think the modernization ideas might profitably be applied to a variety of woodworking plants as well as to sawmills. They would throw out obsolete machinery and readjust the arrangements in the plants.

Some of the officials recently toured the country to find out what might be done to speed up production in case of the need for greater mobilization—which is always regarded as potential—and they came to the conclusion that many plants are losing money because they are operating under conditions that were modern 30 to 50 years ago.

Conferences have been held here between officials of NPA, SDPA, RFC, the Defense Department and others, to determine what could be done to rejuvenate plants that need it. They are on the brink of making a drive to induce the equipment manufacturers to make a survey to find out for themselves what the plants with ancient machinery need, and then to follow through by selling the needed equipment to the plants. Government people call it production modernization by cooperation between



MAKE "CLEAN" MORTISES ON FAST SCHEDULES WITH GREENLEE TOOLS

To make *accurate* mortises easily, swiftly and economically, equip with *high quality* GREENLEE Hollow Chisels and Bits. Long-lived and fast-clearing, these GREENLEE tools add speed to your production, *precision* finish to your products. GREENLEE Hollow Chisels and Bits are made by the originators of hollow chisel mortisers. And GREENLEE produces a complete line of these tools for hard or soft wood and all makes of machines. Write for new illustrated folder M-159 describing these and other GREENLEE tools for mortising, boring, and routing. Greenlee Tool Co. 2142 Herbert Avenue, Rockford, Illinois.

TOOLS FOR CRAFTSMEN

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HOLLOW CHISELS • MACHINE BITS • DRILLS
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GROOVING TOOLS FOR TIMBER CONSTRUCTION

equipment users and manufacturers of equipment. They plan a program of government help in financing for those plants whose modernization can be justified. More will be heard about this in a formal way in the near future.

Gov. Frederick Payne, senator-elect from Maine, has a special interest in woods, forests, wood products and woodworking industries. It may be he will be the industry's champion in the Senate.

Australia, Burma, Cambodia, Laos, Vietnam, Ceylon, China, India, Indonesia, Japan, Korea, Nepal, New Zealand, Pakistan, Philippines, Siam, sent 40 young men to Manila for instruction in the use of modern equipment for felling and transporting timber from tropical forests. The school was organized by the Food and Agriculture Organization of UN, heading up in Washington.

Greece, through the Mutual Security Agency, gets 4,000 American oak railroad ties.

At the NLMA convention, Hillman Lueddemann, president of West Coast Lumbermen's Association, told an amazing story of the billion dollar-a-year lumber boom in Oregon.

Israel's embassy sends word about an $800,000 plywood factory in Palestine, located between Haifa and Tel Aviv. It has been in operation since summer. The machinery was supplied by U.S., Czechoslovakian and Swiss manufacturers. The capital was supplied by U.S. citizens.

More than 10,000 planes have been delivered to the air services the past two years, but Admiral DeWitt C. Ramsey, Ret., revealed the production schedule has slowed down.

Brazil, with 30,000 square miles of highly valuable timber—five major species—seeks capital in U.S. to erect mills, and to install woodworking plants.

Rep. Joe Martin, Jr., of Massachusetts, who will be speaker of the next Congress, was in Washington recently and exhibited a gavel weighing 64 pounds. It is made of redwood, and was cut from a bearing used in the Scotia mills of the Pacific Lumber Co. for the past 50 years. Martin collects gavels. He now has 400.

C. E. Gallaher, late head of the W. T. Gallaher Lumber Co., in Washington, D.C., died here recently at the age of 54. He was prominent locally in clubs and in yachting.

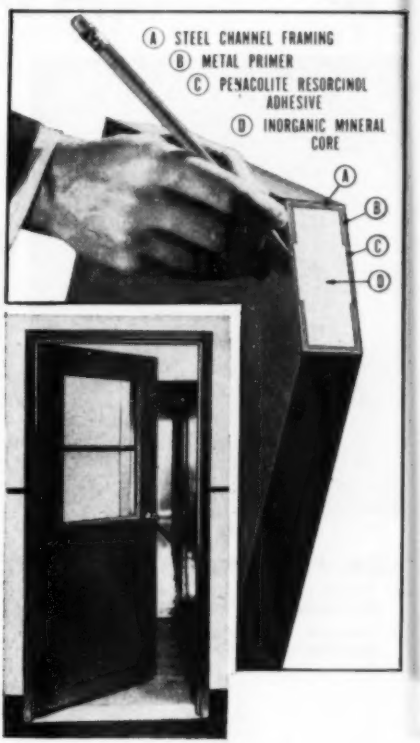
Nationwide forest fire danger is the greatest on record, says chief of forest service.

VERSATILE
PENACOLITE® ADHESIVES
—famous for durable wood bonding—
bond metal fire doors

"PYRODORS," the unique flush metal fire doors manufactured by Dusing & Hunt, Inc., Buffalo, N. Y., have Underwriters' approval. The unusual construction of these doors created a tough technical problem . . . which a Penacolite Adhesive solved. In this difficult application, the adhesive has to bond an inorganic base to a *primed metal surface.* Penacolite Adhesives do the bonding . . . and do it well. Another good example of the versatility of Penacolite Adhesives!

Penacolite Adhesives, the neutral adhesives that have *proved* their ability to form wood bonds as strong as the woods they join, will also bond phenolics, some rubbers, and many plastics, as well as all cellulosic materials.

For the difficult bonding jobs, remember Penacolite Adhesives. And for technical service based on long experience, contact your nearest Koppers Sales Office.



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PENACOLITE RESORCINOL ADHESIVES

The original waterproof, room-temperature-setting adhesives

WE HAVE *Failed* AFTER 75 YEARS
TO SOLVE ALL NAILING PROBLEMS

But THOUSANDS OF PROBLEMS PREVIOUSLY CONSIDERED IMPOSSIBLE HAVE BEEN SOLVED BY . . . . . .

DOIG NO. 45-20-16

DOIG AUTOMATIC NAILERS

NEW FEATURES

A. Wheel on left allows operator to adjust back gage from operating position.

B. Solenoid trip permits operator to trip machine at any position desired.

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STANDARD DOIG FEATURES

1. Anti-friction bearings.
2. Three separate motorized drives.
3. Nail feeder to handle nails from 1 to 3 inches without additional parts required.
4. Nail feeders to give 12 separate nailing combinations.

WRITE TODAY . . . we invite your requests for full details.

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DEPT. 312 — 55 FRANKLIN ST., BROOKLYN 22, N.Y.

CHRISTMAS GREETINGS

I am writing this before Thanksgiving while visiting New Orleans. It was a little hard for me to get into the "Christmas Spirit" for this editorial until I heard a speech at one of the meetings I attended. The speaker deplored many of the unfortunate conditions that exist here and abroad. He appealed to the audience to look up, to turn to God in all sincerity and seek to follow His guidance completely. To that sentiment at this Christmas—or any other time—we are quick to add our approval.

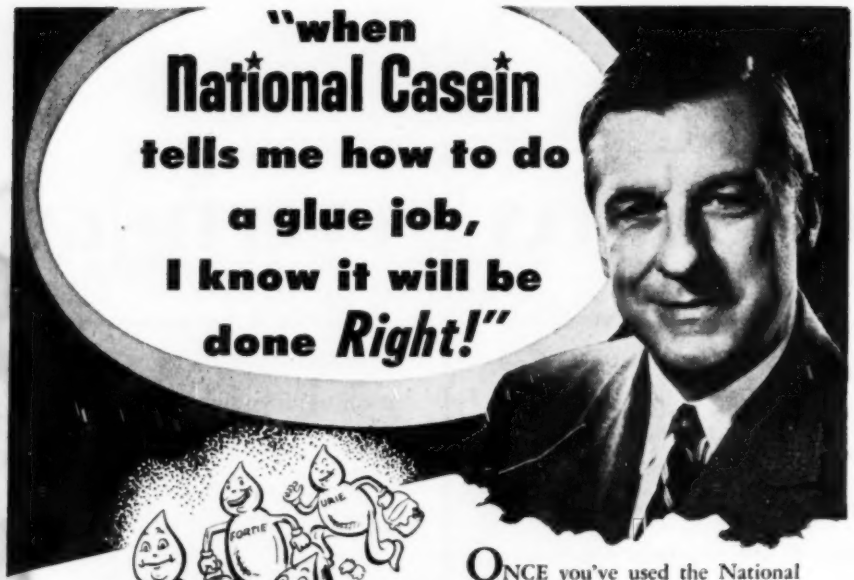
Included in that speech was this anecdote. A man was indulging in a bit of self pity because he had no shoes. Then this man met a poor creature who had no feet. His own attitude immediately changed.

Yes, when we look up to God we will, I am sure, find many reasons why His blessing upon us will prompt us to feel the true spirit of Christmas. We shall then know the "Babe of Bethlehem" in a very personal way and truly celebrate the birthday of the Saviour of mankind.

Our sincere wish here at WOOD WORKING DIGEST for each one of you is that your Christmas may be happy and joyous.

NED BAILEY,
Editor-in-Chief

"when National Casein tells me how to do a glue job, I know it will be done *Right!*"



ONCE you've used the National Casein glue formula we tell you will do your job best — you, too, will agree with the customer quoted above.

We carry no magic wands . . . pull no rabbits out of hats — *never tell you that any one National Casein glue formula will do EVERY adhesive job.*

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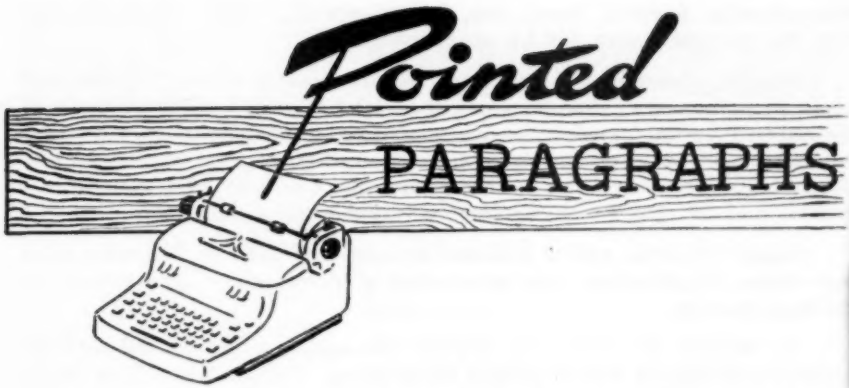

Once again the navy has sent out a call for wooden ships—non-magnetic mine sweepers. This time these wooden ships of the AM 421 class are so designed that shipyards throughout the nation can make any or all parts of these boats.

At the Higgins lumber and plywood yard—where I visited recently—at Michoud, Louisiana, we witnessed the unloading of a few logs from the hold of the "M.S.R.G. Letournea." These were part of a boatload just in from Tournata, Liberia, South Africa. These logs are of more than average interest to us all as they represent the first of their species to reach this country in many years. They were cut from a tract of 500,000 acres leased from the Liberian government by the LeTournea Technical Institute, Ltd. of Longview, Texas. The logs, diameter from 3 to 6 feet, are 25 to 30 feet long. Ironwood and African oak predominate.

A double-pronged forest catastrophe, second only to the famed Tillamook burn in severity, has struck the Douglas fir forests of western Oregon and killed more than ten billion board feet of prime timber. A new pest, the Douglas fir beetle, has teamed up with a vast windstorm. The current problem is to salvage as much of the down and beetle-infested timber as possible in the quickest possible time.

Recently announced is the new all-wood truck body. This was unveiled during the recent meeting of the National Lumber Manufacturers Association. The body has been developed at the Washington laboratory of the Timber Engineering Company and is intended primarily for military use. However, it is also adaptable to civilian trucks. An outstanding feature of the new truck body is its exceptional strength, achieved by gluing and bending much of the wood involved.

The first enrollments for the 1953 Northeastern Lumber Training Institutes were from "lumber-jills." The course will be held at the University of

Massachusetts, Amherst, Mass., Feb. 9 to March 12, 1953. This is the first time the Amherst course will be coeducational.

Augusta, Georgia was the site of the fall meeting of the Prefabricated Home Manufacturers' Institute, November 10-12. Nearly 100 officials of the nation's leading "prefab" home manufacturing companies were present. Introduction of air conditioning as a component part of a "prefab" house was discussed, as were home warranties and the development of the public's interest and acceptance of contemporary architectural designs.

Much time at the prefab builders' meeting was spent in discussing ways and means of providing mass production of demountable type homes for defense housing.

TV business is "very, very good." The upswing that started with the political conventions shows no sign of stopping. Dealers are selling everything the factories can turn out and asking for more. Dealer and consumer interest still runs to lighter finishes. Blonde cabinet woods retain their popularity.

The piano industry is operating at capacity. Sales last year climbed ahead of the previous year and are continuing to gain in '52. Supply and demand have reached the highest point in five years. Almost 30% of sales are in bleached, blonde or colored woods. Spinets show increasing popularity and there is a trend toward French provincial.

Furniture makers are doing well. Indications are that the excellent volume will hold into '53, according to Seidman & Seidman's latest report.

We read in the "F.P.R.S. News-Digest" that 75 of the 100 laminated cross-ties being fabricated at the Teco laboratory for track service studies have been completed and are ready for treating. The ties are to be placed in the main line of an eastern railroad, where they will be subject to heavy service.

Speaking at the fall meeting of the A.S.M.E. in Chicago, Nelson C. Brown, professor of forest utilization, New York State College of Forestry, said, "Wood will never be seriously displaced by any other basic material for furniture in this country. It is too deeply rooted in the American tradition . . . Today the furniture business is a two billion dollar industry."

At the same convention Frank R. Benedict of the Westinghouse Electric Corporation made some startling remarks about U. S. productivity. He said, "Industrial productivity must increase 45% within the next ten years if the United States is to maintain a balanced, expanding economy." A major problem in applying new technological development is that of completely coordinating development of products with development of tools to manufacture them. Without such coordination, economical manufacture may not be possible.

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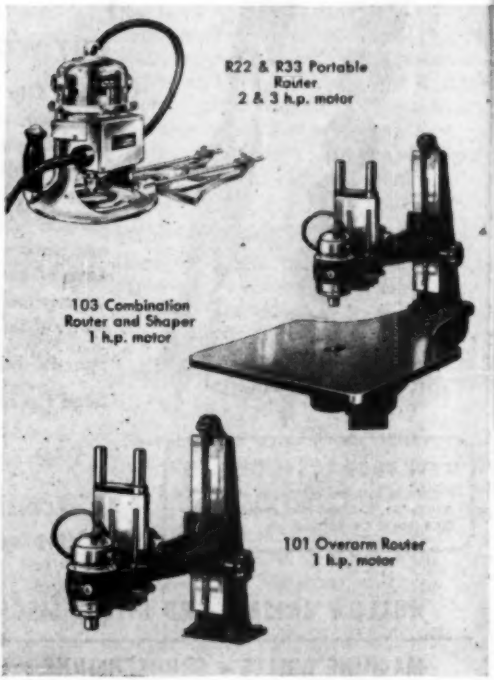

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Reducing
ROUTER BIT BREAKAGE

By Ray C. Reinhartsen

EXCESSIVE breakage of router bits at any time is cause for definite concern since it increases production costs so many ways. It means extra cost for additional bits, less output per operator, more work spoilage and consequently greater material costs. Despite these undesirable factors, routing machine operators, shop foremen, and even plant superintendents often replace one bit after another in a machine without attempting to learn what causes the breakage. Many times they condemn either the bits or the machines, or both, without learning the cause and cure.

This article attempts to list reasons for excessive router bit breakage and to suggest steps necessary for obtaining satisfactory router bit and router performance. It is earnestly hoped that this information will be of help to you in overcoming any problems you face in excessive router bit breakage.

Router bits received from any manufacturer are not always perfect. Carelessness in machine work, in handling or in inspection can occur wherever the human element is involved. Thus inspection by a competent workman should be a fixed procedure on the part of the user with all router bits purchased.

The information given in this article will be of assistance not only in purchasing proper bits for each job, but in spotting incorrectly made bits before they are put to use so that they may be returned to the manufacturer.

Proper Selection of Router Bits
(See Figure 1, 2 and 3.)

Cutting diameter should be determined by either the width of the groove to be routed, or by the thickness of the material to be cut. It is not sound judgment to use a 1/4" dia. bit to cut through 3/4" material. A bit 5/16" or 3/8" dia. is more practical.

It is most important that the bit should be sharp and with proper clearance back of the cutting edge. If such clearance is not provided, the bit will have a tendency to ride the cut, creating friction and heat. This causes material to burn, the cutter to lose its temper, and accumulate sap and dust, and possibly break. Radial clearance should not be ground when resharpening.

Length of Cutting Edge

Length of the cutting edge of a bit should be no more than three times its diameter. For example: a ¼" diameter router bit should have a cutting edge ¾" long. If a longer cutting edge is to be used, an increase in bit breakage must be expected.

Diameter of the Shank: This should be in proportion to the diameter of the cutting edge. Bits 1/4" or less in cutting diameter should have a 1/4" shank. Bits with cutting diameters of 3/8", and over 1/4", should have a 3/8" shank. Bits 3/4" in cutting diameter, and over 3/8",

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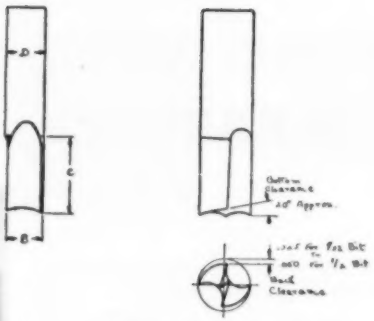
Mr. Reinhartsen is sales manager and vice-president of Onsrud Machine Works, Inc., Chicago.



Figures 1 and 2.

should have a 1/2" shank. Bits over 3/4" in cutting diameter should have a 3/4" shank. Considerable savings in purchasing can be gained through the proper selection of the shank.

Bottom Clearance: A router bit should serve two purposes—first as a boring bit and second, as a radial cutting bit (Fig. 2). To make possible use as a boring bit, clearance of approximately 20 degrees is ground back from each lead cutting edge. Then an undercut clearance is ground into the center and bottom of the bit to eliminate burning of both bit and material. There is no cutting action in dead center.

Single or Double Flute: Router bits are made in either a single or double flute, and flutes are either "O" or "V" in design. The "O" design gives a somewhat sturdier cross section to the cutting edge. Single flute bits cut most freely; double flute bits provide the smoothest cut. A router bit 3/8" in diameter or more can always be double flute for best performance—with choice of "V" or "O"; flute design is optional.

Router bits 1/4" or less in cutting diameter should be single flute, preferably of the "O" design.

Length of Shank: The length of the shank must be of the same as the chucking length of the collet. All shanks should be surface ground to size, plus or minus.

NOTE: Router bits made with simply a turned shank are generally not true to size, may be warped, and may be carburized from heat treating. They not only create bit breakage but in addition, the rough and inaccurate surface of the shank destroys the fine ground finish of a precision made collet.

Hardness: A router bit should be hardened to 62 and 65 Rockwell C scale. Beyond that it becomes too hard and too brittle. It will break quickly with side thrust. Below 62 hardness, the bit will wear quickly with the cutting edge becoming dull and lifeless.

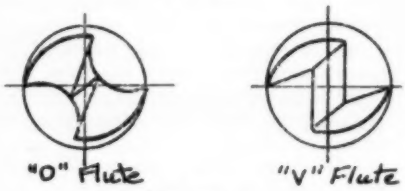


Figure 3.

Some latitude should always be allowed when specifying degrees of hardness. In cutting plywood best results are obtained with a hard bit, but the operator should be careful, allowing the tool to cut its way without pressure.

It has been found that a hard cutting edge and a softer shank will decrease bit breakage. This combination requires an additional operation in making the bits and the manufacturer will usually charge several cents more per bit for doing it. The results, however, justify the expense.

Keep Bits Sharp

Do not use a router bit that has become dull through use. Working with dull bits is like whittling with a dull knife. Dullness of routing bits is one of the greatest contributing factors to router bit breakage.

An operator can actually "feel" a free-cutting bit. When that "feel" is

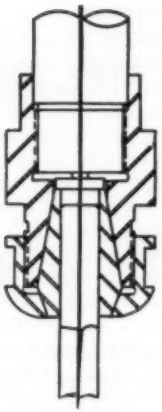


Figure 4.

gone, the bit should be replaced. If replaced in time, it can be reground and used many more times. There are grinding tools made for this purpose.

Feeding Material to Bit

The rate of feeding work to the router bit is important. Actually it is no different than feeding work to a saw blade or to sharper knives. Material should be fed into the router bit slowly as the cutting begins, increasing the rate of feed as the bit takes hold. The bit should have the chance to bite or cut its way freely—the operator exerting a constant and even pressure of material into the bit, at a speed regulated so that the bit works easily.

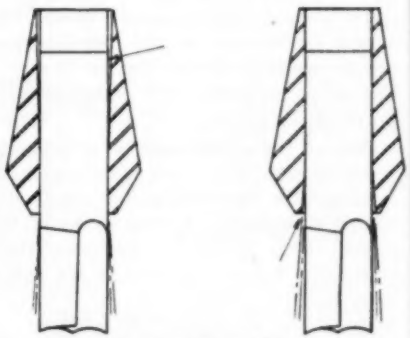
If material is fed too fast, an undue strain is set up against the router bit, which can cause it to spring. If fed too slowly, friction between bit and material will occur and result in burning. Both of these feeding faults are contributing causes to bit breakage and failure of router bits to perform satisfactorily.

When reversing or changing direction of feed, movement must be such that the least possible amount of jar or strain occurs.

Chucking The Router Bit

Most essential in a router is the use of a collet with a double taper and a collet chuck nut to hold bits in the machine spindle. It is the purpose of the collet to grasp the shank of the bit from top to bottom, holding it securely and centering it precisely.

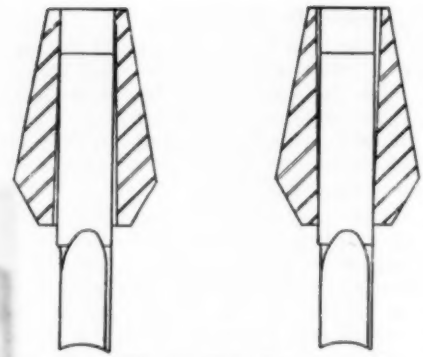
The collet chuck nut holds the collet and bit in the spindle so these parts will not turn or slip under the heaviest load. For precise centering of the routing bit in relation to the center line of the spindle, the collet and the collet chuck nut must be accurately made (Fig. 4). An inaccurate collet or one worn egg-shaped or bell-mouthed cannot properly center the router bit. (See Figures 5 and 6).



Figures 5 and 6.

If bell-mouthed, the bit is held only at its top end, causing it to weave or whip when cutting and eventually to break. Under such action, metal fatigue or crystallization takes place similar to the breaking of a length of wire after repeated flexing or bending. Accumulation of dust and dirt, hammer marks or nicks on the collet or on the routing bit shank will have similar effect.

Never hammer on a bit or collet except with a wooden, lead or copper object. . .and then carefully.



Figures 7 and 8.

The collet must seat properly in the spindle. If tapered, it should bear evenly over its entire surface to the inside spindle taper. Dirt, hammer marks, or a nick on the collet can prevent this proper seating, causing the bit to wobble while rotating and subsequently breakage of the bit.

Bore of the collet must be accurately ground to size. If it is oversize or undersize, positive chucking of the router bit shank is unlikely. Tolerance must be within .0005 + or —, assuming that router bit shanks are held to the same tolerance.

Do not use extremely oversize or undersize shank router bits in an accurately made collet.

Shank of bit will be held either at top or bottom only, causing instant damage to collet and increasing bit breakage (See Figures 7 and 8). A good test for determining whether a bit is held perfectly is to run up the collet chuck nut by hand until tight. If by grasping it at its furthest end the bit can then be moved by hand in one direction or another, the collet should be replaced. Collets should be of spring steel, hardened to 40-45 Rockwell.

Machine Inaccuracy

The possibility of a machine being the source of trouble causing bit breakage should not be overlooked, assuming both the bit and the collet are perfect as to manufacture and specifications. The spindle may be inaccurately made, it may be sprung, or the ball bearings in which the spindle rotates may be worn, or defective. With hand press spindle against bearings, to and from and up and down to determine both wear and end play. If play is found, it should be corrected. Turn spindle in bearings by hand; contact with bearings should be observed. Any tendency to catch means a defective bearing. Worn spindle bearings are not unusual. Every old and much used router can have them.

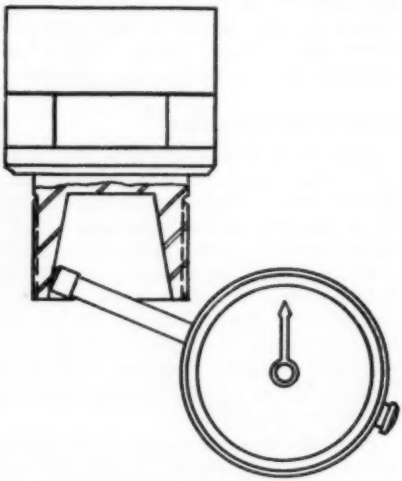


Figure 9.

Replacement of an old and worn-out machine is most economical.

To determine whether or not a spindle is sprung or out of true, place an indicator on the router table. (Figure 9). If the spindle has an inside taper, the indicator will show whether or not this surface is out of round due to defective machining or wear.

A big "bite" comes in handy!

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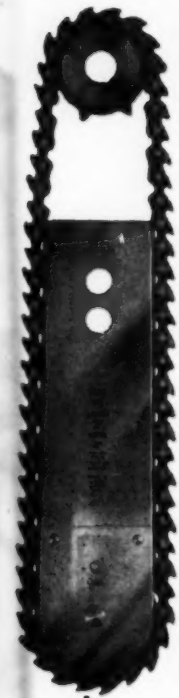

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The outside surface of the spindle should also be checked, first removing the chuck or adaptor. Following this checking, replace adaptor on spindle and carefully check all points which might lead to eccentricity.

Next, try threading the collet chuck nut to the spindle, seeing that it does not fit too tightly nor too loosely. It should be concentric with both adaptor and spindle.

Insert collet in spindle, making sure it is free from dirt or dust. Insert a hardened and ground rod, such as drill rod, in the collet for testing. (The rod should protrude about 2" from the collet.)

Then run up chuck nut until it is tight. Check concentricity by placing the point of indicator against the rod. A run-out of plus or minus .002 may be allowable—if more than this, the cause should be determined and corrected.

Machine vibration is another factor causing router bit breakage. By running the machine after each of the following steps is taken, the cause may be found often by ear or by the "feel" of the machine. The steps in their order are: 1. Remove cutting tool; 2. remove adaptor; 3. run spindle drive pulley only; 4. run motor only.

A properly designed and made router bit is a work of art and precision machining. It is one of our mystifying bargains possible only under production manufacturing. The following operations take place between the bar of steel and finished product: cut off; mill driving groove; grind shank; mill flute; cam grind; stamp trade name; preheat 1600 degrees; high heat 2200 degrees; quench; draw; oil dry; finish cam grind; finish flute grind; inspection; package; stores.

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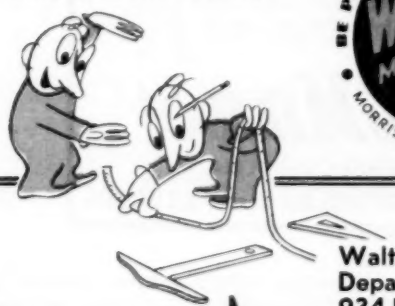

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Masonite and other abrasive materials. Carbides disintegrate in a machine that vibrates. Carbides should not be sharpened in the same manner as high speed steel bits. Your supplier can give instructions on this.

Glue lines are best routed within ten hours from press room. The older the set of glue, the more abrasive is its relation to a cutting edge. Manufacturers of routers provide routing machine accessories and special routing tools permitting hundreds of operations. Among them are: Turning-shaping attachment; reciprocating attachment; hold-down attachment; routing and shaping fence; circle cutting attachment; air operated raising and lowering spindle attachment; disappearing guide pin control; coolant tank and hand operated spindle controls, etc.

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Major reasons why you should use Phillips Recessed Head Screws and Bolts... they are easier to drive... safer to use... no driver slippage... no marring of work... final product appearance is improved.

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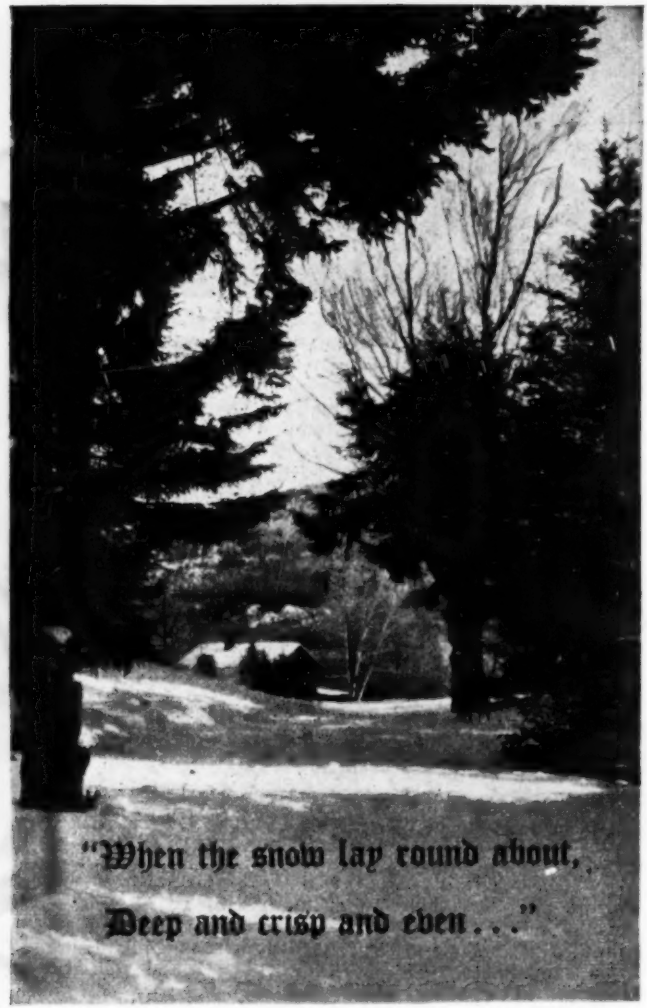
Word has been received from the Department of Commerce, National Production Authority that a number of items are needed for a flooring mill to be erected in northern Michigan or Canada. The equipment— which may be new, used or rebuilt—needed includes kilns, stackers, kiln trucks, conveyors, dust collectors, lumber lift, rip saw, surfacer, knot saws, side matchers, end matchers, bundling devices, grinding equipment, spare parts, etc. Maple, birch and beech will be the woods utilized. If interested, write to E. R. Crane, c/o MacFarlanes Mill, Hilton Beach, St. Joseph's Island, Ontario, Canada.

There are persons so radiant, so genial, so kind, so pleasure-bearing, that you instinctively feel in their presence that they have done you good.

—Henry Ward Beecher

Christmas 1952



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1055 SENECA ST., BUFFALO 10, N. Y.

American WOODS

By reader request we are continuing the listing of American woods which we began in our Directory Issue (October).

We plan to continue this listing until we have covered all of the most popular woods. Then the entire series will be reprinted in booklet form for those wishing copies. Let us hear from you if you wish us to reserve a copy in your name.

BALSAM POPLAR

"Balm-of-Gilead"

Populus tacamahacca, MILLER

Habitat—Strictly a northern tree, balsam poplar's range extends across the entire continent from western Alaska to eastern Labrador, attaining its best development in far northwestern Canada.

Growth and Appearance—It is the largest species found in this area. Top heights of 100 feet and 7 foot diameters are found under ideal conditions. In New England to central Minnesota and also from central Colorado to western Montana it averages 70 feet high with 30 inch trunks. The buds, which are about an inch long, are saturated with a very pungently fragrant, amber-colored balsam called "Balm-of-Gilead" by the drug trade. It is used medicinally as a part of cough medicine.

Availability and Use—The soft wood is uniformly textured, lightweight, weak, easy to work, but not durable when in exposed locations, decaying quickly in contact with the soil. The thick nearly white sapwood surrounds light brown heartwood. The wood makes excellent paper pulp and is easily converted by chemical process. It does not split, is easily nailed and is used a great deal for boxes and crates. Fruit baskets are made from veneer cut from the larger logs. The tree is becoming more popular as an ornamental tree.

BLUE SPRUCE

An Ornamental Tree for Lawns and Gardens

Picea pungens, ENGELMANN

Habitat—Blue spruce is not found in large enough quantities nor is its quality such as to make it commercially valuable. It is found individually or in scattered groves as far north as Glacier National Park in northern Montana, Colorado, Utah, Arizona and New Mexico.

Growth and Appearance—Blue spruce is usually found at elevations of 6000 to 8500 feet above sea level, occasionally as high as 10,000 feet. It is one of the most admired and widely known of all American evergreens. Its pyramidal crown and cool, crisp, silvery blue foliage make it a striking feature of any landscape. A height of 90 feet is about average, some growing to 130 feet and trunk diameters averaging between 2 and 4 feet. Growth is slow. However, the tree lives to be from 400 to 600 years old.

Availability and Use—The commercial value of blue spruce is not in the demand for its wood which is light, soft, brittle, weak and frequently knotty. Blue spruce

is used widely throughout the United States as an ornamental tree. Seedlings display a wide variety and intensity of blue foliage. The nurserymen select the bluest specimens for ornamental planting. Koster's blue spruce is particularly fine for this. This species is propagated by grafting onto other spruce seedlings or transplants. Most blue specimens are grafted on the sturdier Norway spruce. The wood of the blue spruce is nearly white and has local uses for corral posts and poles, fuel, house logs and infrequently railroad ties and mine timbers.

BUTTERNUT or WHITE WALNUT

Most Valuable as a Food Crop Tree

Juglans cinerea, LINNAEUS

Habitat—In the fall, throughout the eastern states and as far west as South Dakota and south as far as Alabama and Georgia, the butternut provides a crop of delicious nuts.

Growth and Appearance—In ancient times the shade of this short-trunked, spreading tree was considered harmful to all life. In modern times its use as a shade tree has become unpopular because few trees reach maturity. Many of its brittle limbs break in wind or snow storms and serious injury occurs from insect or fungus diseases. The tree grows from 30 to 50 feet high and has alternate compound leaves 15 to 30 inches long with 11 to 17 leaflets. These have unequally rounded bases. The leaves and fruit drop early.

Availability and Use—In many rural areas the green nut is picked and pickled as a relish. The tree gets its name from the fruit which has a sticky, pulpy husk enclosing an oblong nut with a rich, sweet, oily kernel. During the earlier days of U. S. history butternut husks and bark were used for home remedies and also in dyeing of woolen cloth. Colonial soldiers wore butternut jeans, a home made, home dyed uniform that stood the hardest service. The nut is far more valuable than the wood although the wood is used for making backs of brushes, bowls, furniture, boat trimming and interior finishing. However, the commercial value of the lumber may increase with present research developments.

CALIFORNIA-LAUREL

Famous for Its Burls—Both Large and Small

Umbellularia californica,

(HOOKER AND ARNOTT) NUTTALL

Habitat—This is the only native representative of the laurel family in western North America and is known also as pepperwood and Oregon myrtle. Its range extends from the Coos Bay area in Oregon, where it grows from 100 to 175 feet high with trunk diameters of 3 to 6 feet, southward along the coastal mountains and lower Sierras to the southern end of California.

Growth and Appearance—This species ordinarily has very short boles. As a rule it divides near the ground into several nearly upright limbs supporting a broad, dense, rounded top, with evergreen leaves. During the second season the leaves turn yellow or orange, falling one by one or remain on the branches for several years. The fruit is a greenish yellow plum-like drupe.

Availability and Use—The sapwood is white to light brown and the heartwood varies from light to grayish brown, often with darker streaks. Hard, heavy and fine textured, the wood works well with tools and when quarter sawn or turned yields remarkable figure effects.

Due to the comparative scarcity of forest-grown logs, only a small amount of California-laurel is available for interior finish and furniture. There is, on the other hand, a big supply of burls

available—both large and small. These are found mostly on the trunks of older trees; free from defects they command high prices. Smaller burls are turned into many beautiful novelties. The larger ones are made into thin veneer. A hobby type of industry has been developed in southwestern Oregon using California-laurel, known there as Oregon myrtle, for paper weights, desk sets, trays, book ends, etc.

CALIFORNIA WHITE OAK

Famous as a Shade Tree

Quercus lobata, NEE

Habitat—This graceful, broad crowned tree with massive trunk and drooping sprays of branches is peculiar to the state whose name it bears. Only 9 of the 14 oak species native to California attain tree size. Of these the California white oak is the largest. It has a limited range from the Sierra Nevada Mountains to the Pacific Ocean and from the Trinity River in northern California to Tejon Pass in the south.

Growth and Appearance—Trees average 40 to 75 feet tall with some up to 100 feet. The trunks are short and massive, ranging in diameter from 2 to 10 feet. The tree grows above sea level to 2700 feet in the north and to 4500 feet in the south. It prefers the valleys and rolling plateaus and was previously called the valley oak. Borne singly and in pairs, the chestnut brown acorns are from 1 to 2¼ inches long with little or no stem. They mature at the end of one season and are used as feed for hogs.

Availability and Use—The California white oak is the least valuable of Pacific Coast hardwoods. The wood is of little value except for fuel. The tree lives to be 125 to 300 years old. The remarkable vigor of these trees is shown by their exceptional ability to develop new, erect, relatively straight branches to replace any lost by storm or disease. Few other species can do this.

CUCUMBERTREE

Root Stock For Ornamental Magnolia Grafting

Magnolia acuminata, LINNAEUS

Habitat—Its range extends from southern Ontario and central New York through southeastern Illinois and the Appalachians to southern Alabama and central Mississippi, Arkansas and Missouri.

Growth and Appearance—In the United States there are seven tree-size native magnolias of which the cucumbertree is the most hardy. It is not common and has little commercial value. Growing rapidly, it matures at from 80 to 120 years. The leaves are large, dark green and the pale yellow flowers are bell-shaped with six petals. The fleshy fruit looks like two or three inch cucumbers, suggesting the name. Similar to the tuliptree, this tree has narrow white sapwood and yellow-brown heartwood occasionally streaked with shades of green. It is not very strong, is soft, durable, close-grained, porous and works easily.

Availability and Use—The use of cucumbertrees for ornamental purposes is on the increase in the eastern and southern states. The principal horticultural use is with the seedlings which are used as root stock on which are grafted several other varieties of ornamental magnolias. The wood can be used for making crates, boxes, cheap furniture, cabinet work, interior finish and flooring. The tree grows readily from seed but requires a great deal of care.

ENGELMANN SPRUCE

Used For First Airplanes

Picea engelmanni, PARRY

Habitat—Engelmann spruce, with its narrow, pyramidal, deep blue-green crown is a feature of the high Rocky Mountains from the Yukon to Arizona. In the western Cascades of Oregon and Washington it grows at elevations of around 6000 feet, growing higher as the range extends south into Arizona and New Mexico.

Growth and Appearance—Attaining heights of 80 to 100 feet and trunk diameters of 3 feet, the tree lives over 500 years. Fire is practically its only enemy. In dense stands Engelmann spruce has a straight, slightly tapering trunk and a fairly short, narrow pyramidal crown of small branches. The lower branches droop and when grown in the open, extend to the ground. Numerous tassel-like side branchlets hang from the main horizontal branches to give a compact appearance to the crown.

Availability and Use—The fine-grained, light yellowish to red-brown wood, though light in weight, is very strong and was used extensively in early airplane construction. It is now used for telephone and telegraph poles, sash, doors and trim. It is the most important of the Rocky Mountain spruces. The tree can adapt itself to eastern conditions as well.

GIANT SEQUOIA

Oldest and Most Massive of All Living Things

Sequoia gigantea, DECAISNE

Habitat—Of the ancient sequoia only two species remain—"gigantea" or giant and the "sempervirens," the redwood. These two continue to grow in the coastal mountains of California and western slopes of the Sierra Nevada at 4000 to 8500 feet above sea level. The giant sequoia has a comparatively small range—only in California. Here they are found in some 70 groves of from 5 to 1000 trees each. The range extends from the North Grove, east to Lake Tahoe and southward for 260 miles to the Deer Creek Grove.

Growth and Appearance—Giant sequoia thrives in shallow grassy basins where the soil is deep and sandy to gravelly. The trunk may rise 80 to 225 feet before the first limb, and be surrounded by a crown rounded at the summit, or much broken, depending upon the age of the tree. Trees generally attain heights of 300 to 330 feet; one in the Calaveras Grove is 400 feet high. The tree has bright, deep green foliage in the form of scale-like, sharp pointed leaves closely overlapping one another on the branches in the manner of cedars. They are "evergreen" and remain on the branches three to four years.

Availability and Use—The wood contains much tannin and when freshly cut the heartwood is a brilliant rose-purple surrounded by a thin layer of white sapwood. Like redwood, its uses are various but the loss in felling is so great, the logs so difficult to handle and the wood so brittle that it is now practically off the market.

GRAND FIR

Tallest of the Firs

Abies grandis, (DOUGLAS) LINDLEY

Habitat—It is found throughout the coast region from Vancouver Island to California, and east through Washington and Oregon into northern Idaho and Montana.

Growth and Appearance—Best known of all the western firs because it is common in the valleys as well as on the mountains, it is a stately, narrow crowned tree rising to heights of 150 to 200 feet. Exceptional trees are 250 to 300 feet tall, with a trunk 3 to 4 feet, or rarely, 6 feet. Standing alone or in the open forest, trees hold their long, graceful

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GARDNER, MASSACHUSETTS, U. S. A.

downward sweeping branches to within a few feet of the ground. The trees are capable of living to an age of 200 to 250 years. The dark, yellow-green leaves are shiny on the upper surface and silvery white below.

Availability and Use—The grand fir usually finds itself made into pulpwood. The soft, firm, straight-grained wood, because of its lack of strength and brittleness, is otherwise used for boxboards, packing cases, slack cooperage, interior trim and rough construction lumber. The wood varies in color from pale yellowish brown to very light brown.

HACKBERRY

A Tree Hard To Recognize

Celtis occidentalis, LINNAEUS

Habitat—The ragged and often unshapely hackberry of the open grows from the Atlantic to the Pacific and barely misses reaching into every state. Best growth is confined to the rich bottoms of the lower Mississippi Valley.

Growth and Appearance—In favorable areas the tree may grow to a height of 130 feet with a trunk diameter of 2 to 3 feet. The hackberry is of more value to the birds than it is to man because of its dark purple, cherry-like fruit which hangs on slender stems throughout the winter. Similar in appearance and related to the American elm, the mulberry and fig, it is easy to understand why early French settlers, unable to identify it, referred to this tree as the "unknown tree."

Availability and Use—The clear, light yellow wood is soft and comparatively heavy. It takes a good polish, but is not durable in contact with the soil and is frequently infested with wood-boring insects. Hackberry is usually sold with lower grades of ash and elm. It is hard, but not strong enough or in sufficient commercial quantities for building construction. It is used for farm implements, crates, boxes, furniture and to some extent for carving.

HAWTHORN

Screens, Hedges, Borders, Fences

Crataegus SPECIES

Habitat—There are more than 150 species of hawthorn in the United States that grow to tree size. The bulk of their distribution is in the eastern United States.

Growth and Appearance—Low and widespreading, these trees are generally less than 25 feet in height with numerous branches and rigid, more or less zigzag branches, round in cross-section and marked by oblong, mostly pale lenticels and by small, horizontal, slightly elevated leaf scars. The spines or thorns, which grow at the base of the twigs or leaves, may be stout or slender, short or elongated, and simple or branched. The hawthorns are typical of open pasture land where they are difficult to eradicate. The bark is usually dark or gray and scaly.

Availability and Use—The wood is close-grained, hard, heavy and tough. Although subject to warping and checking, it is occasionally used for small tool handles and other turned articles. Many of the hawthorns are valuable as ornamental trees and are planted for screens, borders and hedges. The fruit is a favorite with birds and that of several southern species is sometimes used for preserves and jellies.

EASTERN WHITE PINE

Monarch of the Eastern Forests

Pinus strobus, LINNAEUS

Habitat—White pine, long known as monarch of the eastern forests, flourishes from Newfoundland to Lake Winnipeg

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in Manitoba, southward through eastern Minnesota, to southeastern Iowa, and east through Wisconsin, then southward to Georgia.

Growth and Appearance—This tree is the largest of the white pine group, topped only by the sugar pine of California. Some of these trees reach heights of 250 feet and trunks 6 feet in diameter in northeastern forests. Today trees are usually cut when they reach 60 to 80 years and measure up to 18 inches.

Availability and Use—The total commercial stand of eastern white pine in the U.S. is about 12,000,000,000 board feet. It is considered one of the principal economic woods of North America. Although not notably strong, it compares well with ponderosa pine, cottonwood and basswood.

The wood is a creamy white to reddish-brown, soft, straight-grained, cuts easily and polishes well. When properly seasoned there is little warping or swelling. It is used for sash, doors, trim, ship masts, matches, floors, framing, interior finish, patterns, models, boxes, crating, novelties and veneer. Although it is one of the least resinous of the pines, it does have a mildly resinous odor.

HONEYLOCUST

The Tree With the Thorny Trunk

Gleditsia triacanthos, LINNAEUS

Habitat—This tree grows in a great inland region of moist, fertile soils along meadows, stream borders and lake shores from Ontario and western New York to Nebraska, south to Texas and northern Louisiana, and northward along the western slopes of the Appalachian and Allegheny Mountains.

Growth and Appearance—This tree certainly does not encourage climbing. As

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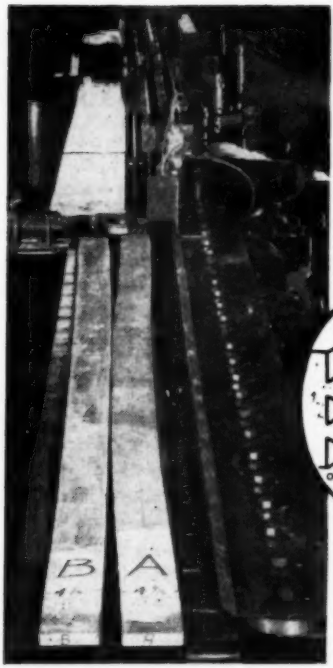
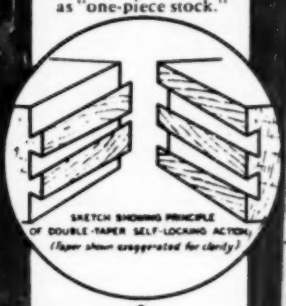


Two 1x4s before going through the machine. Note the 1½" irregularity. Only ¼" is lost in processing, including edge trimming.

The same boards after being assembled automatically into a 1x8 panel rated as "one-piece stock."



SKETCH SHOWING PRINCIPLE OF DOUBLE-TAPER SELF-LOCKING ACTION (Taper shown exaggerated for clarity)

Key to the strength of the joint is the self-locking double-tapered dovetails automatically formed during the process.

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The process is practical for 10 to 16 ft. lengths and for final panel widths up to 12". It is applicable to many woods including Southern yellow pine.

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the Latin name indicates, spines or thorns surround the trunk. They are in reality developments of true buds. The dark brown pods, often a foot or more long, enclosing the brown bean-like seeds of the tree, mature in autumn and are eagerly sought by cattle, deer, rabbits and squirrels. Unlike most other legumes, the thick fibrous roots are without nitrogen-fixing nodules and add no fertility to the soil. The heartwood is reddish or bright brown and has a light thin layer of pale yellow sapwood.

Availability and Use—The heartwood is hard, strong, coarse-grained, takes a high polish and is durable in contact with the soil. It makes good fence posts and railroad ties, rough construction materials, furniture, interior finish and turnings. The supply, however, is limited.

JEFFREY PINE

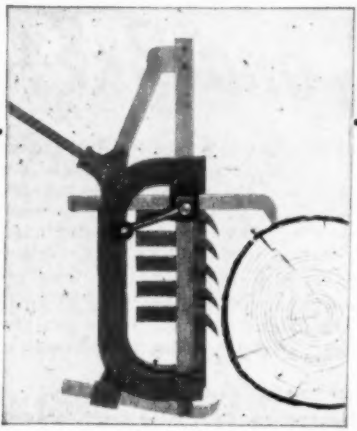
Close Brother of Ponderosa Pine

Pinus jeffreyi, GREVILLE AND BALFOUR

Habitat—Known also as bull and black pine, it grows in particular sections of California, Lower California and Oregon.

Growth and Appearance—The mature trees attain heights of 100 to 180 feet, with short, spreading, or often pendulous, branches. Trees from 200 to 400 years old have trunk diameters of from 3 to 6 feet. The bluish green needles are from five to ten inches long. The seeds are yellowish brown mottled with purple, similar to those of ponderosa pine, but are larger. While Jeffrey pine is a prolific seeder, it produces seed only at a rather advanced age.

Availability and Use—Jeffrey pine is an ornamental tree, mainly because of its symmetrical habit when young and its long, pale-bluish leaves. Figures on stand and lumber cut include both Jeffrey and ponderosa pines—the proportion which the Jeffrey makes up of the total is not



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known. The estimated sawtimber stand of both species in the U.S. is exceeded only by the Douglas fir and southern pine. The wood is similar to that of ponderosa pine and is used for window sash, doors, inside finish. Lumber that has defects in it goes largely into boxes. Much of the heavier, denser wood is employed in house construction for sheathing, joists and rafters.

LOBLOLLY PINE

Grows Faster and Longer Than Any Other Southern Pine

Pinus taeda, LINNAEUS

Habitat—It extends over the coastal plain and lower Piedmont sections from southern Delaware, south and west into the river valleys of eastern Texas and southern Arkansas. It often grows in moist depressions locally called "loblollies."

Growth and Appearance—The tall, straight, cinnamon colored trunk supports a relatively short, open, spreading crown. Trees often attain heights of 170 feet and occasionally reach an age of 150 years.

Availability and Use—The resinous, light brown wood is used mostly for construction, bridges, freight cars, barrel shook, hogheads for tobacco, boxes, crating and interior finish. When treated it can be used for railroad ties and piling. Recently it has been successfully used in the manufacture of paper. Loblolly is the most plentiful of the southern pines and makes up a large part of the cut of "southern yellow pine" which has had an annual cut of over nine million board feet. Loblolly pine grows faster over long periods than any other southern pine.

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Pinus contorta, LOUDON

Habitat—From the Yukon River down the coast of Alaska and British Columbia, through Washington, Oregon and California and most of the Rocky Mountain region.

Growth and Appearance—The tree is frequently gnarled and stunted. While commonly 60 to 80 feet high, it occasionally reaches 150 feet and 30 to 40 inches in diameter. Trees mature in about 140 years, but may live to be 300 years old. The needles or leaves are bright yellow-green and occur in pairs, ranging from one to three inches long. In dense stands, tall, clean, gradually tapering shafts with short, rounded, small-branched crowns are developed.

Availability and Use—Lodgepole pine stands are estimated to contain 22,060,000,000 board feet. Cut for 1946 was estimated at 87,598,000 board feet. The wood is hard, somewhat brittle and straight-grained. The heartwood is usually light brown, tinged with red. The wood is used for railroad ties, construction lumber, fence and corral poles, house logs and fuel. Serious damage is done great areas of lodgepole pine by western pine bark beetles.

OHIO BUCKEYE

Source of Ohio's Nickname

Aesculus glabra, WILDENOW

Habitat—This tree grows in fertile bottom lands and the borders of streams from central Pennsylvania to northern Alabama, and west into northeastern Kansas.

Growth and Appearance—The tree is of medium size, ranging from 30 to 70 feet in height with a trunk seldom more than 2 feet in diameter. The stem divides low to form an irregularly broad, rounded

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crown, with clumsy drooping branches and reddish brown upcurved twigs. In May or early June after the leaves have burst from the large shiny brown buds and have reached full size, upright clusters of greenish yellow flowers appear at the ends of many of the upturned twigs. The ashy gray bark is densely furrowed and broken into large scaly flakes. The younger Michaux found so many of these trees along the Ohio River during his travels that Ohio is known as the "Buckeye state."

Availability and Use—Of so little value commercially that there are no figures to show its estimated stand or annual consumption, it is sometimes used for wooden-ware, pulp, veneers and general construction. It is occasionally planted for ornamental purposes.

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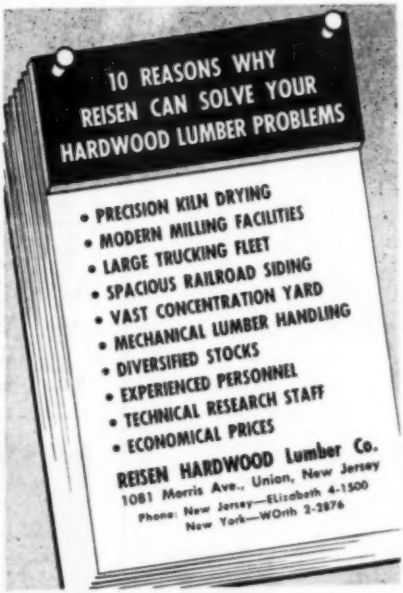

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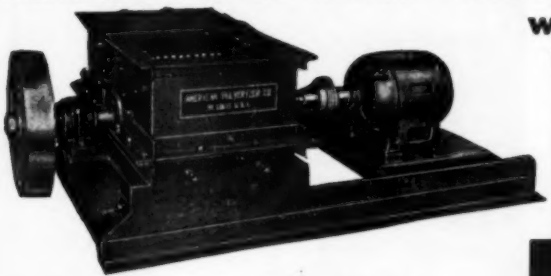

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Perkins Corox liquid ready-for-use vegetable glue is excellent for edge gluing stock to be pressed in a clamp carrier as shown above. Samples of Corox are available to woodworkers.

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The Glue Line

The regular editions of "Perkins Glue Line", external house organ of Perkins Glue Co., have not appeared in recent months for reasons beyond our control.

The publication will appear again in the near future as a quarterly and the several thousand readers on our mailing list will receive each edition.

Glue Powder Storage

Powdered resin or casein glues should never be stored directly on a concrete floor. Moisture from the concrete will considerably shorten the storage life of the resin or casein.

If the storage room floor is concrete, place boards underneath the drums as a precaution.

bonded with Corox may later be hot pressed in panel manufacture without a softening of the glue line.

While longer pressure periods are advisable where possible users of Perkins Corox have reported excellent joints after clamping times of as little as ten minutes.

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Full information and test samples may be obtained from Perkins Glue Company, Lansdale, Penna.

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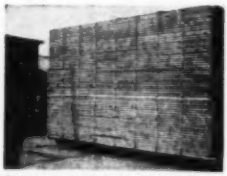
Perkins Glue Company is one of the oldest firms serving furniture and plywood manufacturers. The Company was founded in 1899.



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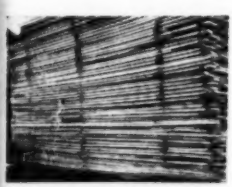

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F.P.R.S. *Clinic*

WHAT GLUE WILL GIVE GOOD JOINTS IN OAK?

This month's report from the Forest Products Research Laboratory was prompted by a question from a manufacturer of wood parts for lamp stands. He was having difficulty with the glue joints opening and asked the above question. Specialists from the Laboratory provide the answer.

THERE are many glues that will give strong durable joints in oak, as well as in other woods, when they are properly used. Conventional animal glues, casein glues and urea-resin glues will all give joints that are stronger than the wood if good technique is followed in their application. Other synthetic resin glues may also be used but, as a rule, their higher price is a disadvantage. Some of the factors that must be properly controlled to insure satisfactory results are discussed below.

First of all, the wood should be uniformly dried to a moisture content of about 7% in order to serve satisfactorily in products for interior use, such as furniture, lamp stands and the like. Wood can be glued successfully, of course, at higher or lower moisture content, but there will be least trouble with shrinking or swelling of the wood in the finished article in use if it is at the right moisture content when glued. In the northern half of the United States and in Canada, where the humidity in heated houses gets very low in winter, wood loses moisture and shrinks. The moisture content may, at times, get as low as 4%. In the summer, on the contrary, the buildings are unheated and the humidity within our dwellings is generally much higher than in winter. This causes the wood to absorb moisture from the air and swell. With high humidities over long periods of time, the moisture content of the wood in houses may get as high as 10% or, in extreme cases, even higher. When articles for indoor use in the cold parts of the country are manufactured at about 7% m.c., they s h r i n k less in winter or swell less in summer than those made at higher or lower moisture contents, and thus give greater satisfaction.

The wood surfaces to be joined should be smooth and flat so that they fit perfectly. With some soft, weak woods, and in the production of lumber cores that are to be veneered subsequently, the smoothness of the surfaces is less critical than with strong hardwoods like oak, maple, beech, birch and some others. In making strong, tight joints in these dense woods, the pieces should be planed or jointed to a very smooth surface, free from knife marks or other imperfections.

It was formerly supposed that glue joints in very hard woods could be improved by roughening the surfaces with coarse sandpaper or other means before applying the glue, in the belief that

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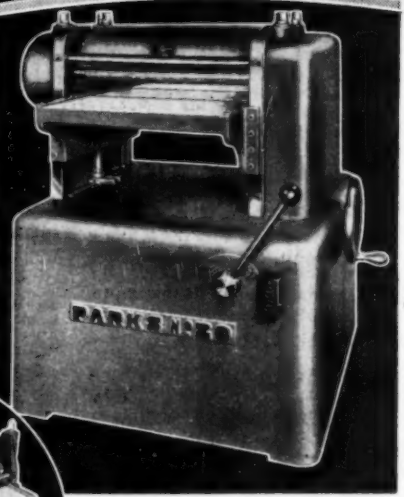

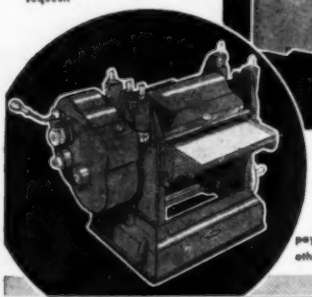

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the roughened surface gave the glue a better "grip" on the wood. This has been shown to be a fallacy. Roughening a good smooth surface will do no good but may do harm to the strength and fit of the joint.

Once the surfaces have been properly prepared, gluing should not be longer than eight hours and preferably less. The longer the delay between surfacing and gluing, the greater is the likelihood that the exposed surfaces will cup slightly, or distort, or collect dirt or grease, all of which tend to reduce the strength of the joints.

Select a glue that has the working properties you prefer and is made by a reputable manufacturer. Then mix it and apply it strictly according to the manufacturer's instructions. Hot animal glue sets quickly after it is applied to the wood and may require more care

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than some other glues in assembling the parts and getting them under pressure promptly. But many manufacturers prefer animal glue and have learned how to handle it with complete success. Casein glues and urea glues permit somewhat longer assembly time than animal glue and are otherwise convenient to use but they, too, are not proof against improper use conditions.

Get the glue joints under pressure within the time specified by the manufacturer of the glue. If high pressure is applied too quickly after the glue is spread, too much of the glue may be squeezed out of the joint and a "starved" joint may result. If pressing is delayed too long, some of the glue may have dried so that it is impossible to get good adhesion between the adjacent surfaces.

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square inch of joint area is about right for oak, but it must be applied uniformly over the entire surface. Good cauls or cover boards should be used between the gluing clamps or press plates and the pieces being glued to spread the pressure. They should be clean and of uniform thickness. Uneven cauls, nonuniform thickness of glued parts, infirm presses, or distorted clamps can produce high pressure in some spots and low pressure, or absence of pressure, in others and cause open or weak joints. If something is crooked, wobbly, or undependable, see that it is corrected.

Make sure that the pressure is not too high or too low. If a hydraulic press is used, calculate the amount of gauge pressure required to give you the correct pressure in pounds per square inch over the joint area being glued, then test the gauge on your press to see that

ONE MATCH
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A MILLION MATCHES can be made from one tree. A MILLION TREES can be burned by a forest fire started with one match in careless hands.

it reads correctly. Gauges get out of order sometimes and may be very misleading. They need to be checked occasionally and kept in good adjustment. With hand-tightened clamps, torque wrenches can often be used that will indicate the pressure applied. Technical skill and know-how are required, however, to determine the amount of pressure that should be applied to the torque wrench in order to provide the required unit pressure on the glue joint. In the absence of any method of determining the pressure applied, the appearance of the glue squeeze-out is a useful indication to skilled workmen, but it can be deceptive and is not subject to good technical control.

Leave the glue joints under pressure long enough to set thoroughly and be safe to handle before releasing the pressure. This may require four to eight

hours, or overnight. Follow the glue manufacturer's directions. The glued material should then be allowed to dry long enough to avoid sunken joints before any surfacing is done. The time required will depend somewhat upon the glue and the storage conditions. It may be as long as seven days at 80°F. and 30% relative humidity or as short as 24 hours at 160° F. and 44% relative humidity.

If you have followed all of the foregoing precautions, you should have good joints with any good glue. If you still get poor joints, it may be time to call in the "glue doctor" who can detect the source of the trouble and show how to avoid it. There is much published information on how to do good gluing that goes into greater detail than is possible in a brief article such as this. If you are interested in further information, write to the Editorial Department of WOOD WORKING DIGEST, 222 E. Willow Ave., Wheaton, Ill.

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The first complete reference manual of its kind ever prepared, it is being distributed by local building associations throughout the country as a guidepost for American political, civic, business and labor leaders concerned with the problem of how best to provide good, comfortable housing for all our people.

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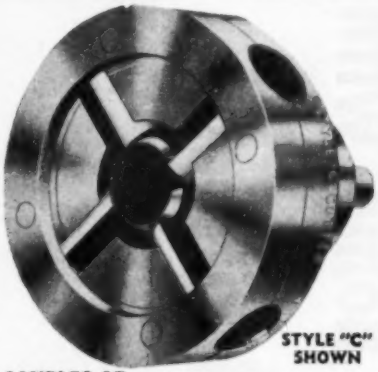

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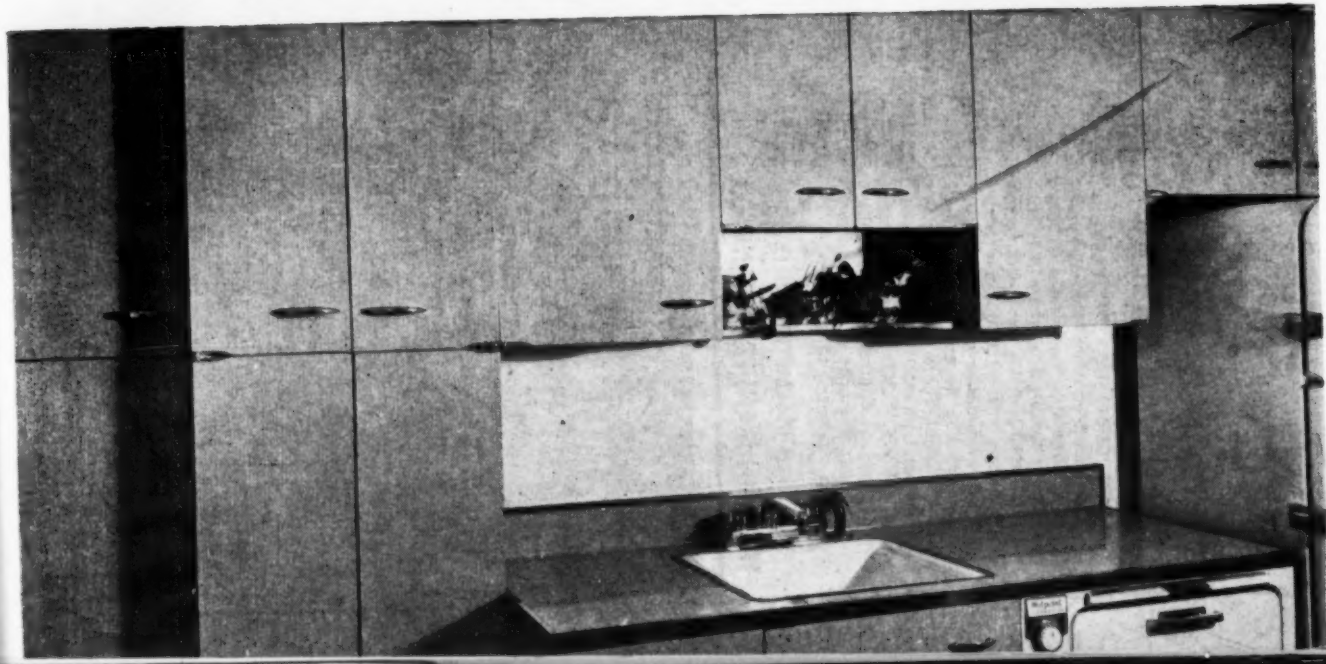

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SECTION

Spray Painting

PART 2

PRACTICE

By **L. W. Lammiman,** Technical Service Manager, The DeVilbiss Company

UNIFORMITY of product is important in successful production operations, and is necessary for repeat business. Control is the basis of uniformity of product, and extends even to uniformity of finish of the products.

Controlled finishing, with its accompanying improvement in the quality of the finish and economies in material and labor, is practical for smaller manufacturers as well as for the larger plants.

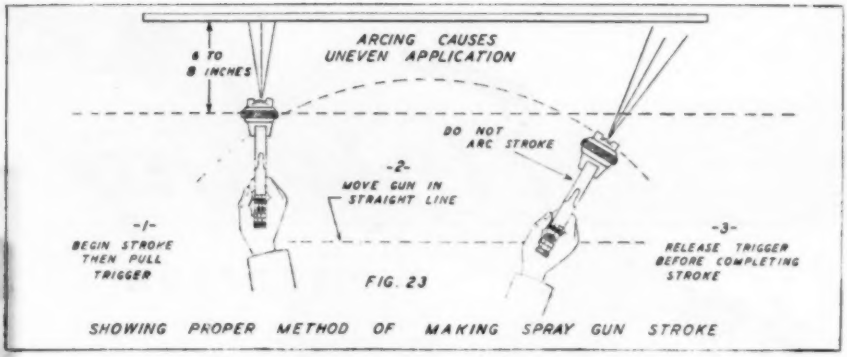
Control over the uniformity of finish embraces many factors, such as the type of product or surface being coated; the quality of the material; the spray equipment, its adaptability for the work, its condition and adjustment; and the man behind the spray gun.

Controlled finishing in an industrial finishing room includes material control of (a) viscosities, (b) mixing, and (c) delivery; control of fluid pressures; control of air supply and pressure; control of film thickness; control of spray equipment and repairs; control of exhaust, replacement air, temperature and cleanliness in the finishing room.

Such control setup for the larger industries pays for its upkeep many times over by economies effected, rejections minimized and satisfied customers. For small plants, because of the limited quantity and variety of material used, such a degree of control may not be so practicable, but even in small plants many of the control ideas are applicable and will be found advantageous.

Material control includes control of viscosities, mixing and delivery of finishing material.

All mixing rooms are, or should be, equipped with a viscosity cup or some means of metering the viscosity of finishing materials to be supplied the spray operators for application. It is known that each material has a certain viscosity which is considered as the best point of flow. Possibly a temperature standard has also been recommended for best application of the



material and for highest quality of finish.

If material is thinned too much its hiding capacity may be impaired. It may have a tendency to run or sag. Consequently the best possible material control should be set up to hold materials at their proper viscosities, and to use the type and quantity of thinners recommended by their manufacturers.

The man in charge of mixing materials should be instructed in the proper care and cleaning of his equipment; how necessary it is that all material be strained; why viscosities must be maintained; and, where he has several manufacturers' materials in use, how necessary it is that he use the thinner corresponding to the material being mixed.

Mixing and Delivery

Mixing room control should be such as to insure uninterrupted production schedules, and to prevent shut-downs due to dirt in materials with consequent gun troubles, rough finishes resulting from improper viscosities, or other difficulties brought on by using wrong thinners, thus tending to produce excessive orange peel or improper drying and possibly causing a quick breakdown of the finish.

Control of the delivery of the material to the spray guns and operators cannot be passed over lightly, due to the cost of the material sprayed by each gun in the course of a day.

Wherever paints or finishing materials are applied by hand spraying, the man behind the gun is an important factor. Spray operators may be compared in general to house painters, interior decorators and artists. Although all use the same materials and tools, each man may have certain abilities not found in others. Operators spray differently, and control is necessary for those who have the least ability.

A large manufacturer interested in the possibilities of controlled finishing decided to find out how nearly alike his operators sprayed insofar as material consumption was concerned. He installed a fluid flow meter at one position in his production line and checked each operator working at this position. Each man sprayed 50 of the same objects with no control on fluid passing to the spray gun. It was found that one operator sprayed one pint more of material on each of the 50 objects than any of the other operators. Fluid control was quickly adopted resulting in a considerable saving per unit.

Other savings are effected on the wear of the spray gun parts. If the material is regulated to the spray gun in such a manner that the spray operator

Spray painting school furniture in a Binks spray booth.

can leave his fluid adjustment wide open on the spray gun, allowing the fluid needle to be drawn back out of the fluid tip opening, less wear occurs on the fluid tip and needle and longer life of these parts is assured. Then, too, with fluid control and with the spray gun fluid adjustment open, the pull of the fluid adjustment spring is taken off the trigger. Consequently, the operator triggers the gun more frequently, cutting off the spray and eliminating the waste of material at the end of each stroke of the gun.

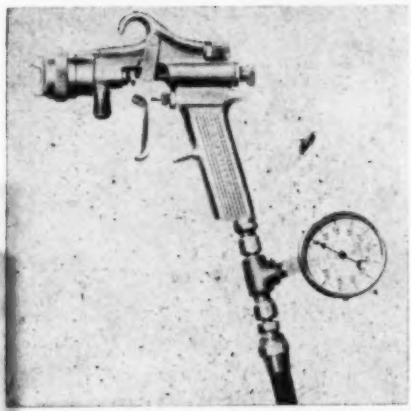
The size of fluid hose recommended for best control of material flow to the gun is a ⅜ in. I.D. x 11/16-in. O.D. spray painting hose. This size permits sufficient material to be supplied to the spray gun, so that the hose is washed clean by the constant movement of material. This is desirable because some materials have a tendency to drop out of suspension. Hose of this size also is light and flexible, giving the operator better control of the spray gun.

Control of Air Supply

Control of the air supply and pressure is necessary. There are several methods and diverse opinions as to the preferred method and the most effective pressure to employ. Air is to a spray gun what gasoline is to an automobile engine. Both are necessary to create action.

However, it might be well to mention some facts which have a general bearing on air supply and pressure. In most large factories the air compressing equipment is located in a clean room and the intake air to the compressor is usually taken from outside the building. This air is compressed and discharged into a large air tank very closely connected to the compressor. The air is then piped to a large tank centrally located and known as an "after cooler." It is equipped with cold water coils or some other means to cool the air as it expands on entering the tank. The air is then piped all over the plant to points wherever compressed air is needed. The size of the pipe depends on requirements in cubic feet of air necessary to operate all spraying equipment and other air tools. Air lines act in the same way as a storage tank and the larger the pipe the less the drop in pressure.

The air line usually consists of a galvanized iron pipe from the compressor storage tank to the transformer



Checking on air pressure at point of air supply line.

(the equipment by means of which the air is filtered of oil, moistures and other impurities and the pressure regulated), and a length of hose from the transformer to the spray gun. Both pipe and hose must be of sufficient size to restrict as little as possible the passage of air through them. The main air line should not be smaller than the outlet valve through which the air leaves the air storage tank. Pipe take-offs from the main air line to the transformer should never be smaller than ⅜ in.

All air lines should have sufficient elevation so that all moisture collected in line will drain back to air tank, where it can be drained off. All branch pipes should be taken off at the top of line and then dropped down to the operator or machine where air is used.

Common sizes of spray gun air hose are 1/4 in. and 5/16 in. inside diameter. The larger the hose the less restriction there is in the volume and the smaller the drop in the pressure of the air. Large manufacturers have found that a 5/16 in. I.D. x 5/8 in. O.D. hose is best suited for production spraying. This size of hose is flexible and light, and the loss in air pressure between the air outlet and the spray gun is very small. The 1/4 in. size air hose is not recommended with standard production spray guns and should never be used in this service in any length over 12 ft.

In analyzing many cases of so-called spray gun or material trouble, it has been found that a small diameter air hose was being used which was "starving" the spray gun, and this condition was reflected in the finish obtained. Although the air passages in spray guns have been enlarged from time to time to insure the proper volume of air reaching the air cap, this improvement is too frequently offset by the use of too small size air hose. After all, it is at the nozzle of the spray gun that the proper volume and pressure of air is required.

Air pressure drop is the difference between pressures at the point in air supply line at which the air hose is connected and the actual pressure gauge reading at the spray gun. The amount of pressure drop which occurs in various lengths of 1/4 and 5/16 in. air hose is shown in the accompanying table.

One investigation of what was considered to be spray gun or material trouble disclosed the fact that a small diameter air hose was being used. The operator swore that he was using 105 lb. air pressure (a much higher pressure than would be recommended for his material), yet this pressure was not sufficient to properly atomize the material. A test gauge was attached to the air inlet on the gun and it was found at that point the air pressure was 48 lb. He was spending hours of labor sanding and rubbing the finish produced because of inadequate pressure. This was eliminated as soon as his small air hose was replaced with the proper size.

There are, of course, other causes for loss of volume and pressure in an

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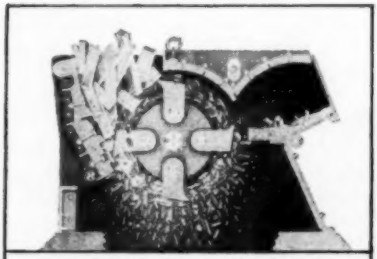

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Drop in Air Pressure

(To be expected from various lengths of ¼-in. and 5/16-in. air hose when used with spray gun equipped with air cap consuming approximately 12 cu. ft. of air per min. at 60 lbs. pressure.)

	Air pressure drop at spray gun					
¼ in. I.D. air hose (Pressure in Lb.)	5-ft. Length lb.	10-ft. Length lb.	15-ft. Length lb.	20-ft. Length lb.	25-ft. Length lb.	50-ft. Length lb.
40	6	8	9½	11	12¾	24
50	7½	10	12	14	16	28
60	9	12½	14½	16¾	19	31
70	10¾	14½	17	19½	22½	34
80	12¼	16½	19½	22½	25½	37
90						
5/16 in. I.D. air hose (Pressure in Lb.)						
40	14	18¾	22	25¼	29	39½
50	2¼	2¾	3¼	3½	4	8½
60	3	3½	4	4½	5	10
70	3¾	4½	5	5½	6	11½
80	4½	5¼	6	6¾	7¼	13
90	5½	6¼	7	8	8¾	14½
	6½	7½	8½	9½	10½	16

air line. These include rusty pipe, leaky valves and connections in the air line, old hose and worn or loose fitting hose connections. But air hose if improper diameter and length may be a contributing cause by "starving" the spray gun and resulting in a faulty finish. Proper allowance for pressure drop should always be made.

Where there are several operators grouped on a production system, master regulation is recommended. A line should be run from the main air line to a header located immediately over the operators. The hook-up leading from the main air line should enter the header in a central location. The master regulator should be located in the line between the main air line and the header. The regulator must be large enough to pass sufficient air to the spray guns being used.

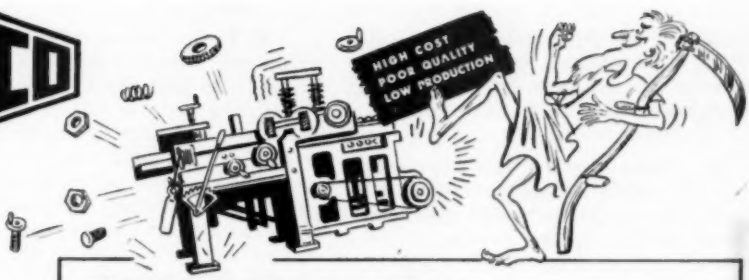
With a master regulator controlling the air, all operators have the same atomizing pressure, and products are sprayed with a uniform finish. This eliminates the tendency of individual spray operators to adjust air pressures to suit their own ideas. Control here prevents uniformly mixed materials from being sprayed with widely varying air pressures.

Where several operators are using air regulated by one master regulator all air hose should be of the same size and length. Each operator then has the same drop in air pressure between the air outlet and the spray gun.

Spray Equipment

Control of spray equipment includes supervision of all spray guns, tanks, transformers, air and fluid hose, hose connections, and all repair parts needed for equipment upkeep. A central control system for all spray equipment used in the various departments has been found to be the best plan. It is a fact that spray equipment is too often abused and neglected. Spray guns, tanks, transformers and hose are allowed to go uncleaned for weeks. When such conditions are permitted to continue for even a short time, parts of the equipment are found to be in such

ECCO



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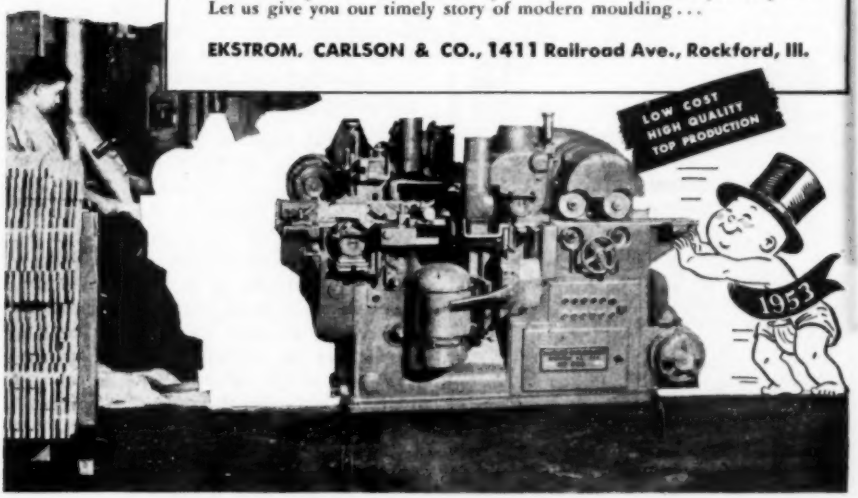

condition that replacement is necessary. Parts are replaced that would have functioned satisfactorily if they had been properly cleaned and re-assembled in the equipment.

In several plants where the central control system for spray equipment is used, inventories on repair parts have been reduced to one-fourth, and the cost of repairs to one-third of previous costs. Spray equipment requires care and good housekeeping. The central control sytem should be under the supervision of a man who understands this type of equipment. He should know something about the application of materials, and be capable enough to pass judgment on the equipment and know when it is working satisfactorily.

With the trend toward the application of finishes becoming more of an exact science and less rule-of-thumb, and with the supervision of finishing in the hands of technically trained men, more and more progressive plants are increasing the efficiency of their finishing rooms through the use of control methods.

It is to the interest of executives in industries whose products are spray-finished, to consider the advantages of control methods, and to see that spray gun operators are carefully selected, properly instructed, adequately safe-guarded and supplied with the best of spray and exhaust equipment to do good work easily and economically. Any manufacturing plant in which key men do not fully understand spray equipment and its control, should have its men trained in this work.

It is a good policy to install an air condenser at each air outlet, and, indeed, is necessary in some localities where a high water content is found in the air at all times of the year.

Spray Technique

There is an excellent opportunity for motion - study analysis in connection with use of spray guns to determine the most efficient methods of painting any particular project. Of course, the same system that would be used on one item may not be at all suitable for most efficient application of paint to another item. However, where mass production finishing methods involve the use of a spray gun, a detailed study of spraying technique for each type of item handled will usually be found an extremely paying proposition.

Study Flat Surface Spraying.

Possibly one of the most elementary factors that should be understood thoroughly at the outset is the most efficient method of spraying a flat surface. The proper method of making a spray gun stroke is to avoid swinging the spray gun in an arc. The arc method is wrong because too much paint is applied at the center of the stroke and too little at the extreme ends. Also, the distance between the gun and the work may vary almost on a ratio of 2 to 1. Waste due to excess vapor, of course, results. Center of stroke is wet while ends are dry and frosty.

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Under such conditions it is easily seen why it is extremely difficult, if not almost impossible, to apply a uniform layer of paint. The correct procedure is to hold the gun at right angles to the surface at all times and to trigger the gun at each end of the stroke; that is, begin the stroke, then pull the trigger. At the end of the stroke, release the trigger before the stroke is completed.

The reason some operators do not trigger the gun as suggested is quite simple. Instead of cutting down the fluid flow by adjusting it either at the pressure feed tank or at the fluid regulator, they make the mistake of adjusting it by means of the fluid adjusting screw on the spray gun. Turning this adjusting screw inward to reduce the material flow increases the spring tension on the trigger. Naturally, it becomes extremely hard to pull and tires the operator's hand after a short period of time. This results in a tendency not to trigger the gun properly. This difficulty can be eliminated by permitting the fluid adjusting screw on the spray gun to be left wide open. Then, in practically all cases, the necessary adjustment can be made at the pressure feed tank or at the fluid regulator.

If this plan is followed the user will find that less material will be consumed, there will be less fatigue for the operator, there will be reduced wear on the spray gun parts such as tips and needles, and an improved finish will be obtained.

The second important factor is to hold the spray gun at all times perpendicular to the surface being painted. Most satisfactory results will be obtained when the spray gun is held some six to eight inches away from the surface.

Plan Gun Movements

In painting any particular assembly, the most efficient combination of spray gun movements to produce the desired coverage should be worked out carefully and not left to the individual operator's discretion. Someone familiar with motion study, working in close cooperation with a man in the finishing department who is thoroughly familiar with spray gun technique, may possibly produce the best system of painting any particular project.

In using any spray gun there are a number of adjustments of extreme importance. These should be studied carefully. Best results are dependent upon the proper flow of material from the nozzle, correct proportioning the atomizing air pressure of flow of material, and proper spray width. The usual spray gun contains an adjusting screw which affords control of the flow of material from the nozzle. As mentioned above, to assure maximum ease in triggering the gun it is recommended that this control be left wide open in practically all cases.

A spreader adjustment affords a means of changing the spray pattern from a round spray to various width fan sprays as may be required.

In making adjustments of the spray gun, too high an atomization pressure is to be avoided since it will spread or thin out the center of the spray pattern. Insufficient air pressure will produce a spattered effect. This results in the material covering the surface in beads or drops. This adjustment can be checked by studying the spray pattern produced by the gun.

In working out a motion study on a particular product, an experimental period using various settings of the adjustments will be found of value in determining the most efficient operation. Note, too, the different results obtained by changing fluid adjustments, atomizing pressure and spreader adjustments.

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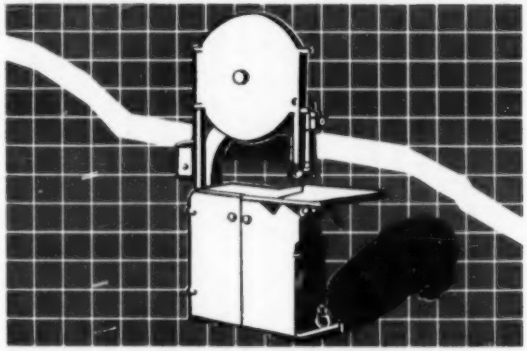
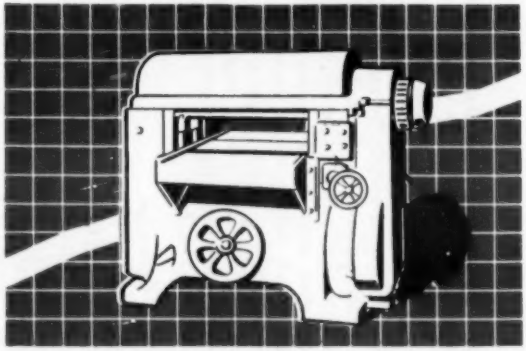
*Patent applied for.



Decreased Re-sharpening Costs



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Since flow of material from the gun nozzle determines the speed at which the gun must be moved across the surface, the speed of operation sometimes can be increased greatly by using a setting which permits faster flow of material. Then, to prevent excessive deposits of paint, work out a sequence of motions which will prevent overlapping of the spray pattern as the article is painted. A comfortably rapid stroke should result in sufficient coverage without runs or sags.

Instruct Gun Operators

Often the maker of the spray gun and associated equipment will be found able to furnish definite suggestions for improving results. Often suggestions made to the spray gun operators will enable them to greatly reduce fatigue connected with the work, and if this is explained to them when the motion study analysis is being made, it permits obtaining their cooperation more easily. An efficient and carefully worked out motion study may be the means of making a significant saving in painting operations as well as making possible a much higher production from the equipment.

In any motion study for spray guns it is desirable to determine the fewest number of strokes and least amount of motion necessary to obtain the desired coverage. To this end, the design and use of suitable fixtures will be found a great aid.

Of course, it is most essential to follow at all times the directions of the spray gun manufacturer regarding the best way to clean the gun and to keep it in the best operating condition if maximum painting efficiency is to be obtained.

Conclusions

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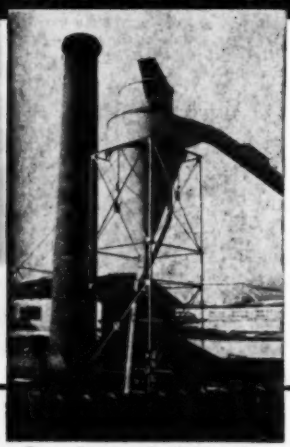

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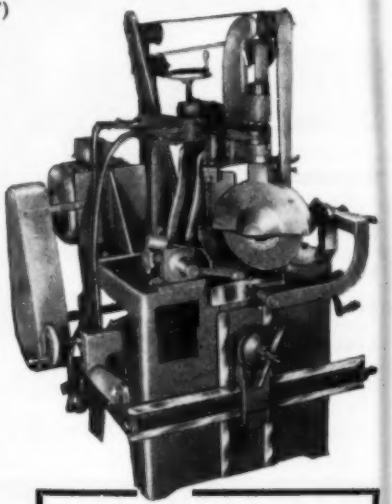
- **GET THE FULL STORY** of the "724". Write for BULLETIN No. WWD-122.



For rip and cross-cut saws from 6" to 36" diameter, with teeth spaced from 10 points per inch to 2" spacing. Other sizes up to 84" diameter and larger.

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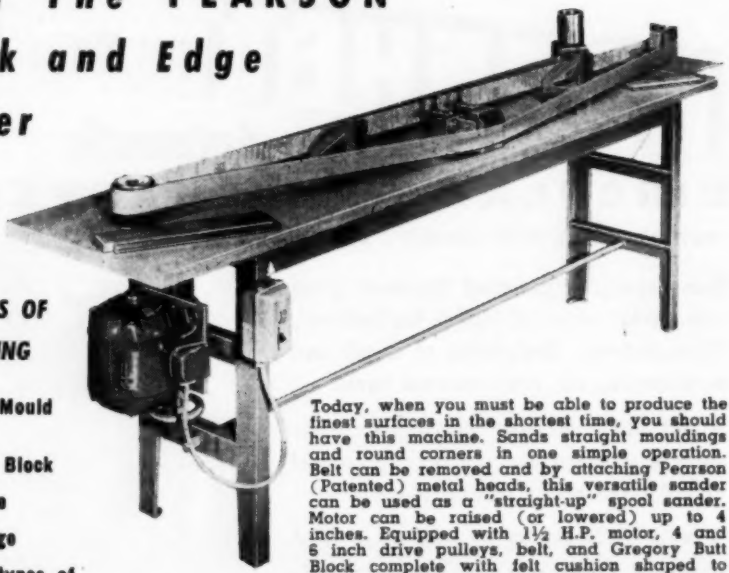

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als, results are still dependent upon the ability of the man behind the gun. There is a proper technique of spraying and that should definitely be followed. If the operator holds the gun six to eight inches from the surface, moves it parallel to the surface, triggers the gun at the end of each stroke and overlaps each stroke properly, he is using the correct technique and should be applying a quality finish. On the other hand, if he waves his arm haphazardly spraying into the air rather than on the work and continues to hold gun open even off the surface, then the finish is likely to be poor and the waste of material reflected in higher costs than necessary. Operators should be trained, for skilled spray mechanics are just as important as proper equipment and proper material.

This subject is far broader than this presentation could possibly cover. Not all of the materials in use have been

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covered. Not all the equipment nor methods of application have been delved into for that would require more than the allotted time. It was the intent to cover the subject from its most important angles. The commonly used materials, essentials in equipment for spray gun application and some suggestions on controls have been pointed out. Where quality finish is the aim in production then the essential preparatory steps will be taken to smooth the surfaces from the wood in white through the finishing process; the finishing materials used will be of highest quality and controls will be established to assure a mix to formula, to maintain temperature and consequently viscosity; to select the proper spray equipment; to feed it with a constant clean supply of air; to have efficient handling, exhaust and air replacement equipment and to insist on orderliness and good housekeeping; to have trained personnel in operating positions using a technique which not only produces quality results in the least laborious manner but does it at a minimum of cost. Such conditions are ideal and are attainable.

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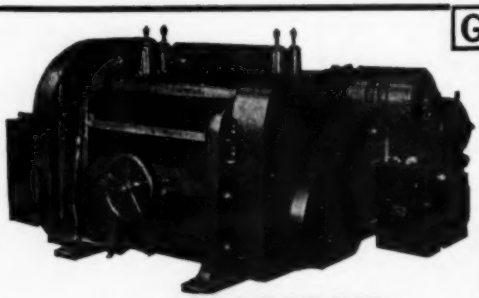

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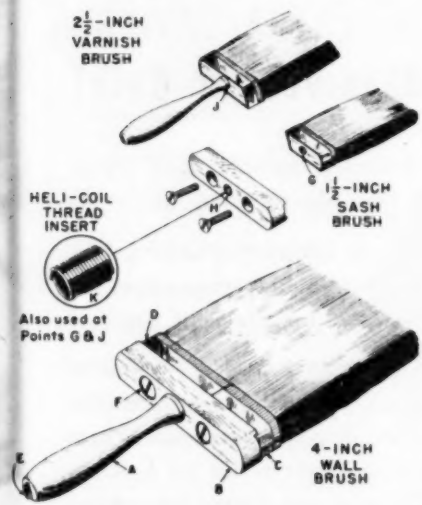
THREAD INSERTS FOR PAINT BRUSH HANDLES

This diagram shows how stainless steel wire thread inserts—Heli - Coil Corp., Danbury, Conn., is the manufacturer—can strengthen a paint brush and make possible variation in design. We are told that insert-protected wooden threads experience negligible wear over the many cycles of handle disassembly required to fully utilize the brush's versatility.

The Baker Brush Company's "3-4-1" paint brush has three basic parts: handle (A, Figure 1), wooden bridge section (B, Fig. 1.), and two bristle sections (C & D, Fig. 1). Each of these sections can be combined with the handle to form either a 1½" sash brush or a 2½" varnish brush.



Imbedded in the upper end of the wooden handle is a small piece of steel (E, Figure 1) acting as a screw driver point for inserting or removing the machine screws. When bristle sections are assembled and secured with screws passing through the bridge into the wooden bristle heads, a 4" wall brush is formed. Reversing the handle and screwing it in place into the bridge completes the wall-brush assembly.

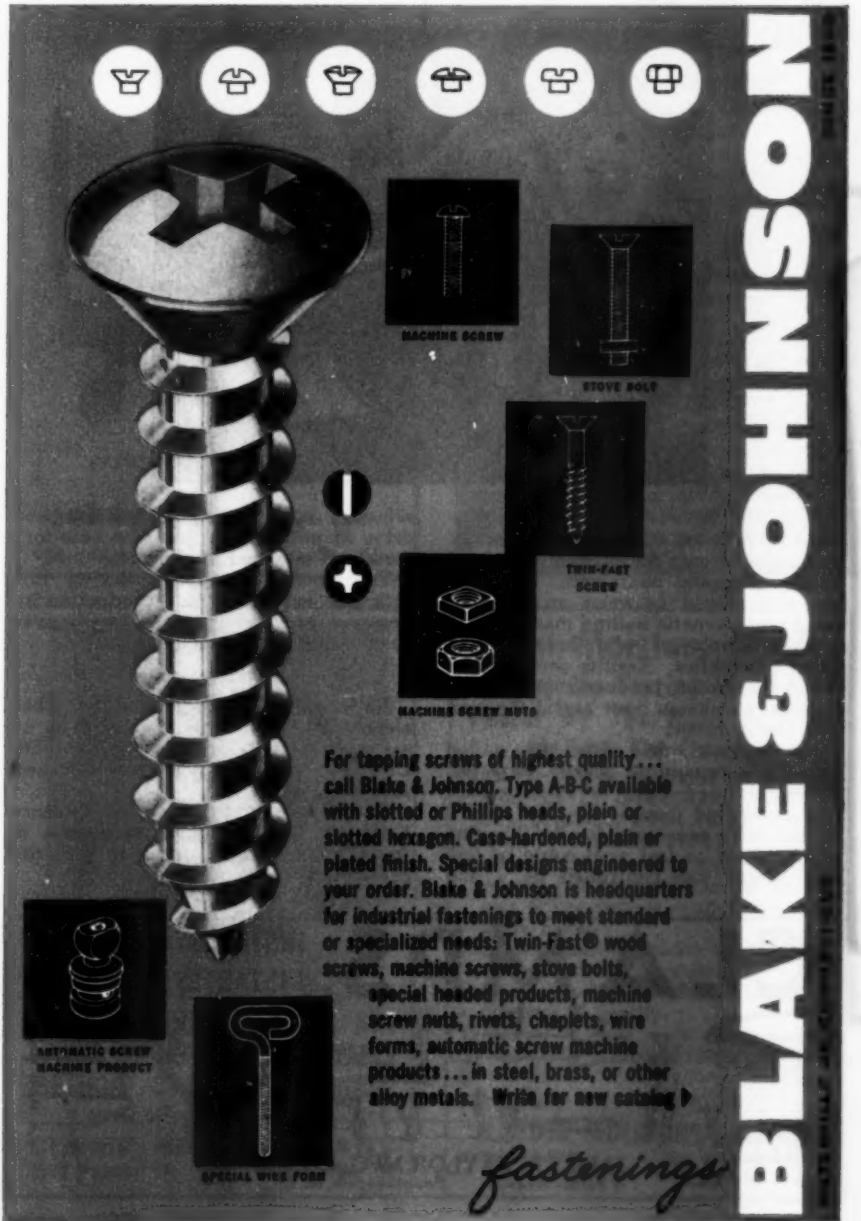
Easily installed with an inserting tool, three ¼-20 inserts (K) are used in assembly of each brush. One insert is used in each of the two bristle sections (G and J, Figure 1). These holes are for the threaded end of the brush handle when smaller brushes are used individually, and for the machine screws when all parts are combined into a wall brush. Another insert is used in the wooden bridge (H, Figure 1) to reinforce the threaded hole used for the brush handle when the 4" wall brush is formed.

DOWEL PIN REAMERS

Lavallee & Ide, Inc., Chicopee, Mass., announces the introduction of a reamer set selected especially for the reaming of dowel pin holes.

The set consists of fourteen reamers, in pairs from ⅛" by sixteenths. Each pair includes one reamer .0020" undersize and one .0005" undersize, except the ⅛" which has .0020" and .0003" respectively. Tolerances are .0000" and -.0002".

Sizes ⅛" through 5/16" are ground from the solid and made with external centers; larger sizes have polished flutes and internal centers. All have a back taper of .0005" per 1½", with no relief on the flutes. Each shank is stamped with the exact size for quick identification.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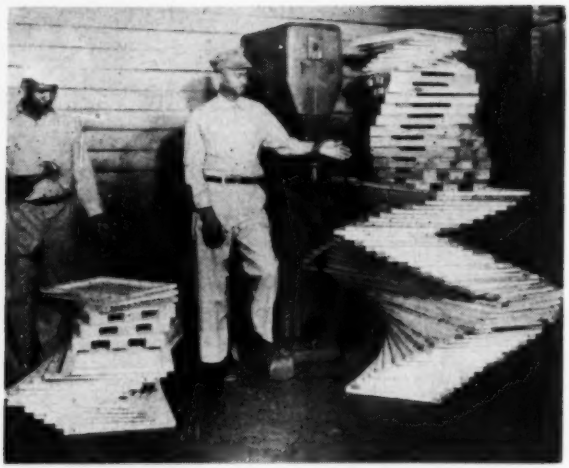
MAN VS. MACHINE



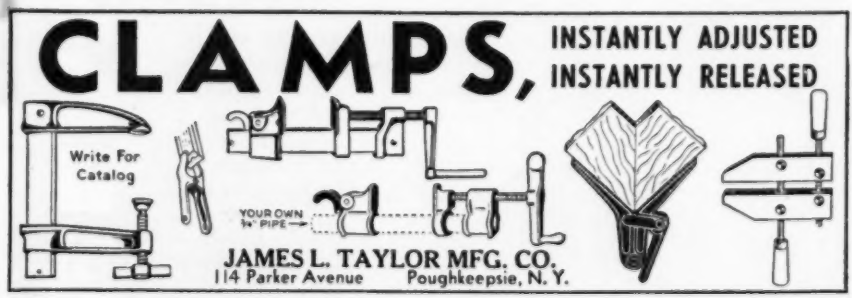
A "battle" between a man and a machine in Atlanta, Ga., has produced an interesting report for manufacturers of wooden shipping containers. The contest was staged between an operator using an automatic nailing machine and another employee who hand-nailed shook assemblies. Results showed that the Auto-Nailer produced four times as many shooks an hour as did the man with the hammer.

The skid was made of ¾" pine nailed onto 1¾", remaining pieces were ⅛" plywood nailed onto ¾" pine cleats. Top and skid measured 17½"x21¼". No jigs were necessary for the machine which nailed as fast as it could be fed. Nail length was controlled by a dial selector, and not only did it cut and drive at one motion, but also countersunk and clinched at the same time.

The photograph accompanying this article shows one hour's production by hammer and nails vs. one hour's production by Auto-Nailer.

National Starch Products Inc., has elected **Dr. Carlyle G. Caldwell** as an assistant vice-president of the firm. Dr. Caldwell is an authority on starches, adhesives and resins.

The Carborundum Company, Niagara Falls, N. Y., has appointed **Joseph S. Imirie** to the position of assistant to the president.



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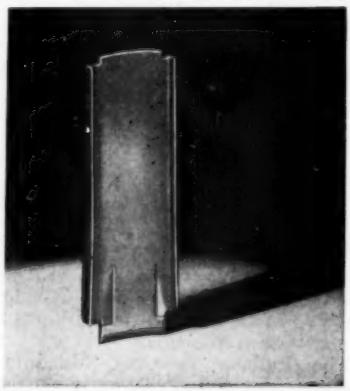

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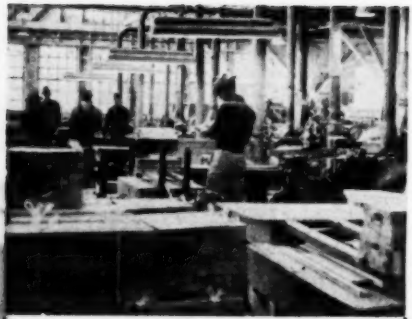

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Appointments

Donald F. Murphy has been elected a vice-president of Rohm & Haas Company, manufacturers of resins, chemicals and plastics. Formerly he has served as assistant secretary of the company.

Hanna Engineering Works of Chicago has two new sales representatives. Sale of Hanna products in Minnesota and northwestern Wisconsin will be handled by **Haldeman-Langford,** 2580 University Ave., St. Paul 4, Minn. Sales in central and southern Indiana and northern Kentucky will be handled by **Scott Equipment & Engineering Co.,** 54 W. 30th St., Indianapolis, Ind. These two companies can give prompt delivery on Hanna air and hydraulic cylinders and control valves.

Frank M. Goodman and **Herbert N. Meisner** have been appointed district sales managers for Delta Power Tool Division of the Rockwell Manufacturing Co. Mr. Goodman will be responsible for the area of Mississippi, western

Frank M. Goodman

H. N. Meisner

Alabama, Tennessee, eastern Louisiana and Arkansas. Mr. Meisner will cover western Iowa, northwestern Illinois and southwestern Wisconsin.

The Indiana Foundry, Machine & Supply Company of Brazil, Indiana, announces the appointment of **Arthur Calpha, Jr.,** to the position of assistant manager.

Howard E. Earl has recently joined the Sundstrand Machine Tool Co., Rockford, Ill., as chief engineer in charge of an engineering department for the development of Sundstrand's pneumatic and magnetic products.

FASTER FASTENER News

"When it's TWIN*fast* it stays fast"

Up-to-the-minute pointers on speeding assembly —cutting construction costs

NEW UNIFIED STANDARD CONSOLIDATES SQUARE AND HEXAGON BOLT AND NUT DIMENSIONS

A new, comprehensive product standard for square and hexagon bolts and nuts eliminates needless variety and duplication by consolidating specifications for various types of bolts and nuts that have similar proportions, characteristics, and applications.

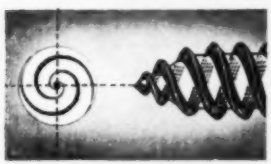
Previous dual classifications have been replaced by single series, using existing American Standards as a basis. The new standard has both national and international acceptance. It contains complete dimensional data, material recommendations, and product specifications.

Now, new designs can be based on the use of fasteners that are completely interchangeable. Further benefits include greater economy of manufacture, increased availability of standard bolts and nuts, and improved quality and service of products.

Prepared under the sponsorship of the American Society of Mechanical Engineers and the Society of Automotive Engineers, the new standard has been officially designated *American Standard ASA B18.2-1952.*

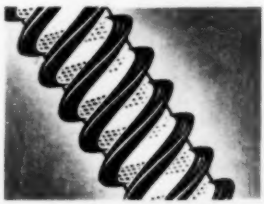
SINGLE, CENTERED POINT ASSURES QUICK STARTING, BALANCED DRIVING

The TWIN-fast Screw has a single, centered point, formed by the meeting of the twin threads at the axial center of the screw. This assures quick starting, self centering, and easier driving.



PARALLEL TWIN THREADS PROVIDE TWICE THREAD PITCH, REQUIRE HALF DRIVING TIME

Although TWIN-fast Screws are standard as to sizes and threads per inch, they provide twin threads which spiral the root from opposite sides. This results in a thread pitch that is approximately twice as great as that of ordinary screws.



There are two major advantages in this greater thread pitch: (a) With a single turn of the driver, twice as much thread area enters the wood as with ordinary screws under the same performance. Driving time is thereby cut in half. (b) Since only half as many turns of the driver are required, the threads cut by the screw as it travels into the wood are subjected to only half as much friction and wear. The stripping torque is substantially increased. The threads themselves are specially designed and have hard, sharp, blade-like edges which cut deep, clean threads into the wood.

TWIN-fast Screws CUT COSTS FOR WOOD, PLASTIC OR COMBINATION ASSEMBLIES

TWIN-fast Screws effect a better fastening in plastic and combination assemblies as well as in wood.

They offer many advantages to the manufacturer yet cost no more than ordinary screws.

TWIN-fast Screws are available in steel and brass, in all standard sizes, with round, flat, and oval heads. Special lengths and diameters are also carried in stock or made to special order.

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Blake & Johnson Company
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National Screw & Mfg. Co.
Cleveland, Ohio
Los Angeles, Calif.

Stronghold Pacific Corp.
Downey (Los Angeles) Calif.

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Southington Hardware Mfg. Co.
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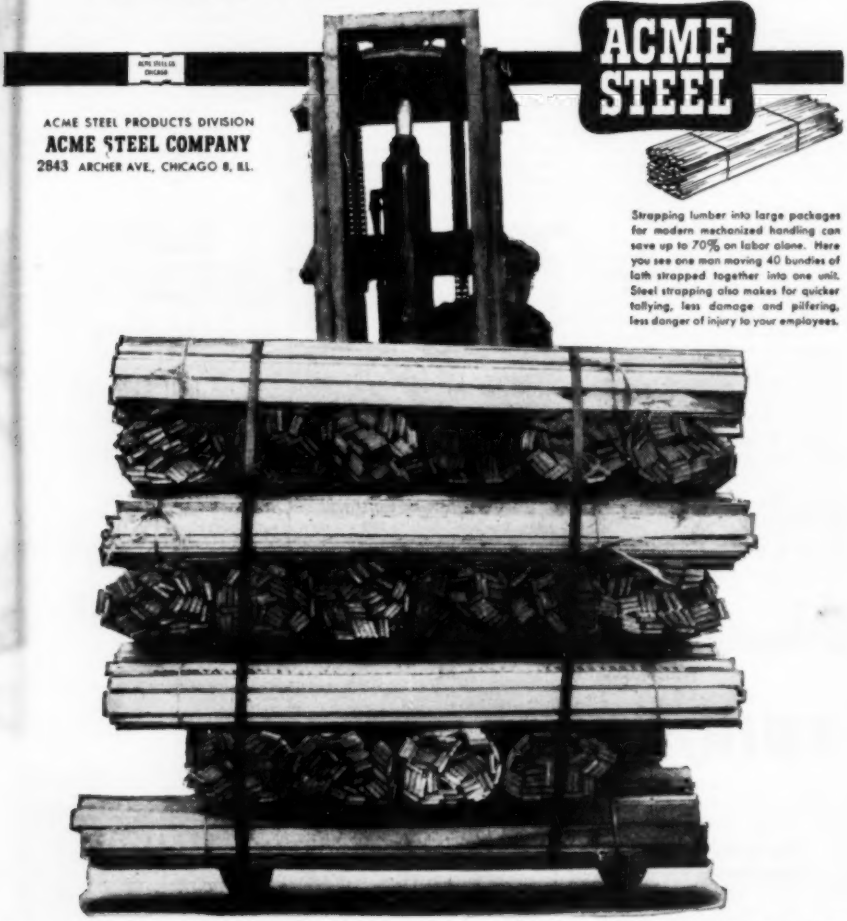

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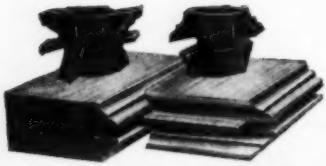

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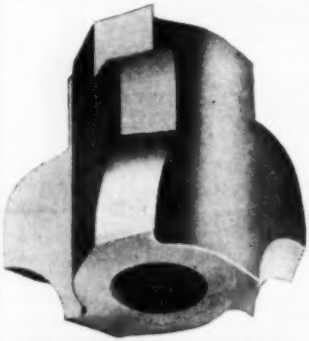

COMBINATION DROP LEAF TABLE CUTTER

Made of high speed steel, also Vigorite Processed for long wear. Used on shapers with ½" to 1¼" spindles; one cutter cuts male and female joints. Write for prices.

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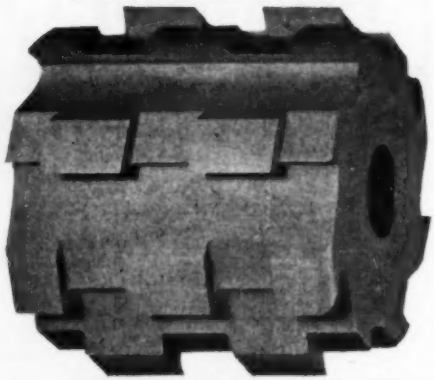

For use on shapers. Cuts smoothly with and cross grain. Will shape birds-eye maple, curly and cross-grain stock, twisted grain birch, without tearing out and will not raise the grain. A fine tool for tapering chair legs and backs. Furnished in one size only, 2¾" diameter, 2¼" thick, ¾" to 1¼" holes. Vigorite processed for long wear. Write for circulars.

Mooradian Ball Bearing Shaper

Spindle furnished for cutters having ½", ⅝", ¾" and 1" holes, with double shield lubricated ball bearings.

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WOODWORKERS"

Hand Glue Spreader

Roller drops deep into pot of glue and projects high enough to allow short or long stock to be moved over it to take a spread of glue. An ideal combination for work bench service. Saves brushing, smearing, daubing and wasting glue with brushes and sticks.

Light pressure of stock moved over roller causes roller to turn and carry a continuous spread of glue from pot to surface of wood.

Can be used in any size pot large enough to admit roller. Clean — economical — inexpensive — satisfactory.

Champion Dovetail Glue Spreader

Saves Time, Labor and Annoyance

This is one of the most convenient devices for spreading glue on dovetail work as well as in mortise grooves. The spreader sets over the glue pot and the revolving wheel brings up the glue as the work is run over it. The aluminum dovetail wheel fits standard dovetail joints, and the straight wheel fits mortise grooves.

Cold Glue Gun

Used with liquid hide and other cold glues. Eliminates waste. Nozzle is 6" long extending at right angle from can. Has holes at sides near ends of nozzle which enables glue to be forced into sides of dowel holes. Adjustment screw controls amount of glue.

Priced at $6.50

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Roller for use in glue pot. Corner blocks are rolled over wheel, which spreads the glue on both sides.

The Hallock Glue Gun

For Hot Glue—keep warm in electric pot.

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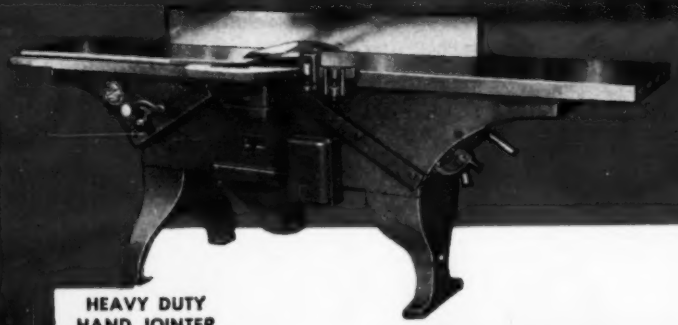

HEAVY DUTY
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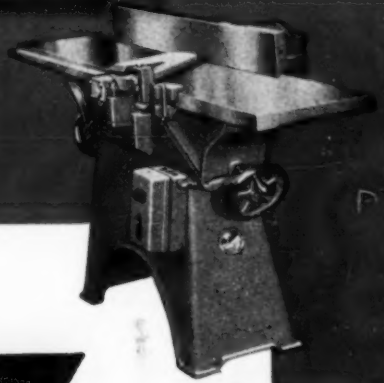

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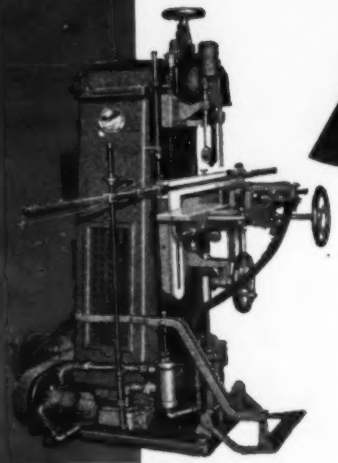

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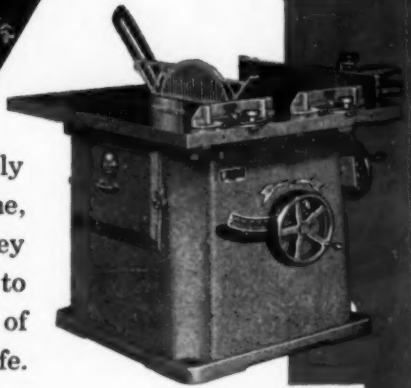

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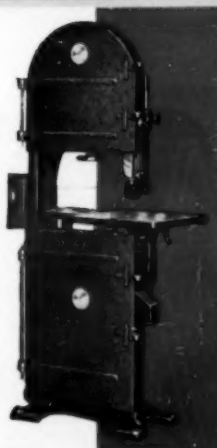

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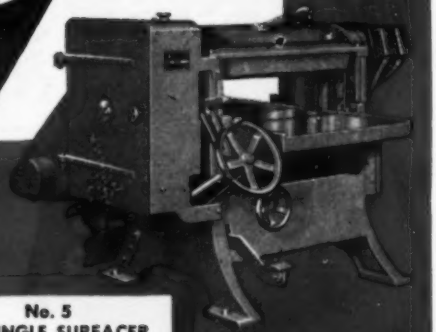

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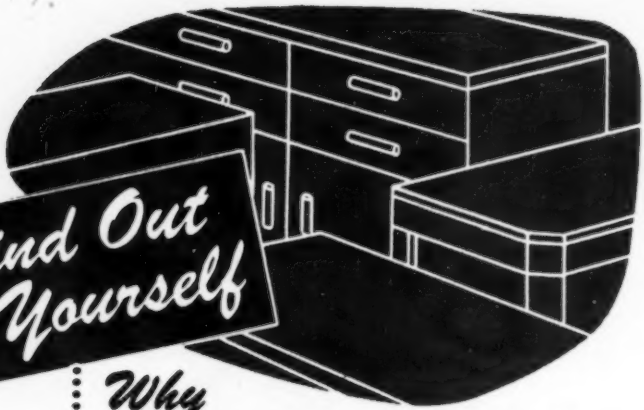

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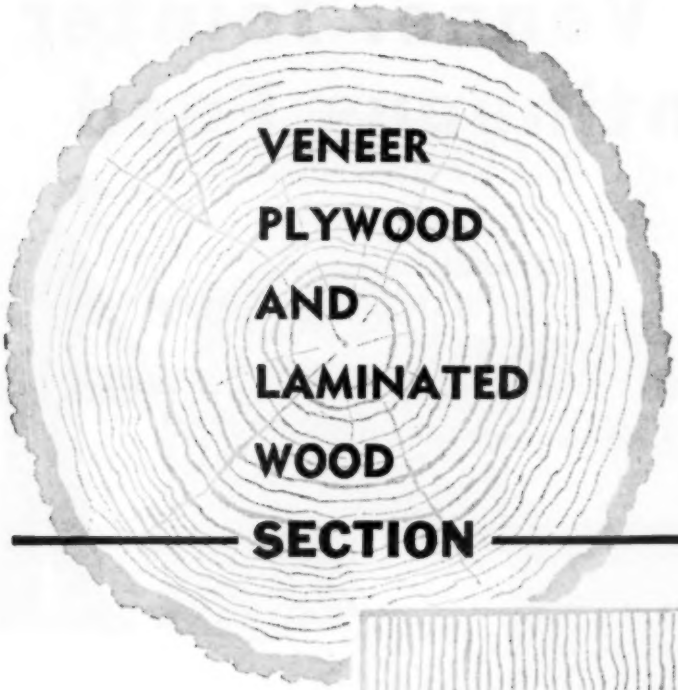


VENEER PLYWOOD AND LAMINATED WOOD SECTION

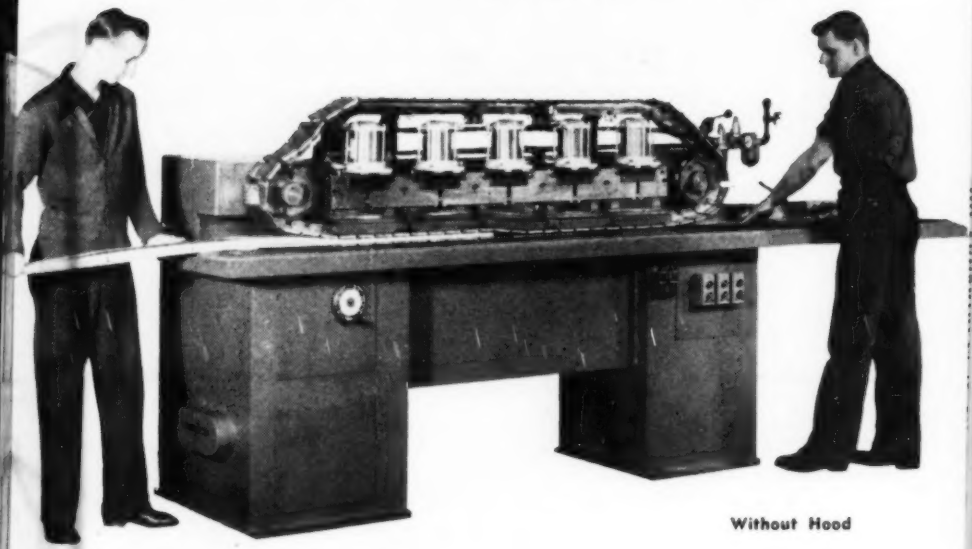
Features . . . .

Types of Plywood
By Thomas Perry

Electronic Gluing
Part 3

Veneer Splicing and Laminated Constructions
By Paul H. Graham

New Veneer Jointer Continuous Feed



Without Hood

We firmly believe this Jointer is far superior to any other Veneer Jointer on the Market.

It contains mechanical principles never before applied to a Veneer jointer.

Has pneumatically operated Hold Down Shoes!

Pressure is under Perfect Gauge Control!

Joints LONG AND BUCKLY STOCK!

Has Glue Spreading Attachment for application of Resin Glue.

Send for circular giving further details.

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Makers of the Famous Dennis Taping Machine
Over 2000 in use

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ELECTRONIC GLUING

A Survey of equipment applications

Part 3—Veneer Splicing and Laminated Constructions

By **Paul H. Graham**

THE popular use of electronic gluing equipment has now been extended into the field of tapeless splicing of veneers by high frequency heating methods to shorten the curing cycle of the glue line and to permit handling thicker materials. Electronic gluing has been able to speed up this operation to production speeds as high as 85 f.p.m. which permits production of 18,000 lineal glue-line feet and over by a single splicer per day.

Electronic veneer splicers operate with a traveling chain bed and an overhead heating arrangement powered by a high frequency generator. This heating element operates to set the glue line as the veneer sheets pass along the chain bed. These machines are usually hooked up in tandem with a veneer jointer which joints the veneer edges square and runs them over a glue spreader just before delivering them to the electronic splicer. Variable pressure bars hold veneers flat, and a V-way brings the edges tightly together for a solid joint which is free of glue.

The machine studied in this veneer splicing application was the Diehl electronic tapeless splicer (Fig. 1) manufactured by the G. M. Diehl Machine Works at Wabash, Ind. This machine is designed for edge gluing veneer and core stock of thicknesses from ⅛" to ½". It handles previously jointed stock with or without glue applied on edges, joins the stock to a tight, invisible splice with little or no sanding necessary. The glue is set by use of high frequency passing through an electrode mounted in the upper heater bar. The Calrods mounted in the lower heater bar are for flaking off any glue adhering to the heater strips. This machine gives infinitely variable speeds from 18 to 85 f.p.m. (or faster), depending upon the veneer length, flatness, moisture content, thickness and density.

The Diehl electronic tapeless splicer completely eliminates the use of paper tape in laying of veneer. Thus, veneer strips are completely and securely glued together—edge to edge—in an invisible splice, to form single sheets of perfect veneer without having to apply and remove tape before completing the operation.

Two strips of veneer, the edges of which have been previously jointed (or jointed and glued), are laid flat on the table top at the infeed end of the machine. The edges are then pressed lightly against the thin stock guide, and the forward edges are matched. Next, the two sheets are fed together into the converging matching rolls. The veneers are carried forward automatically by these rolls and by the feed chains. As the

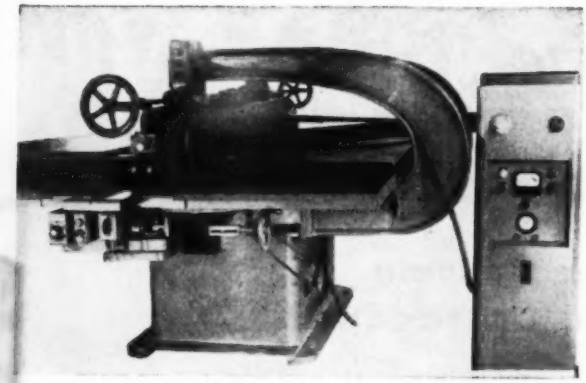


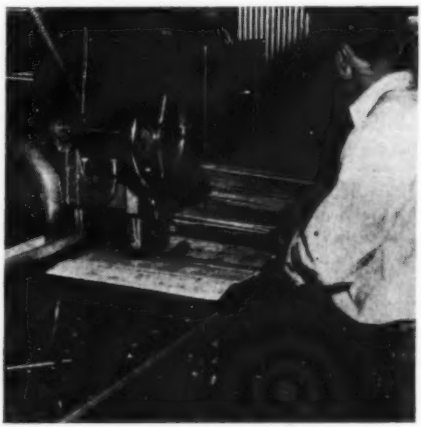
Fig. 1. Diehl electronic tapeless splicer with Westinghouse 2 kw. generator.

Courtesy G. M. Diehl Machine Works.

veneers enter the machine, a resin glue may be applied, or a moistening and setting solution may be applied instead, if the edges have been previously glued. The edges are then brought tightly together. Heat is applied from above and below to set the glue. Pressure is applied to flatten the veneers while being joined. Listed here are a few examples of Diehl machines in use.

Mersman Brothers Corporation, Celina, Ohio: This company is the world's largest exclusive manufacturer of occasional tables. This plant employs more than 600 people, and they have 400,000 square feet of floor space in their plant, 350,000 of which is devoted to manufacturing.

The factory is completely mechanized and modern — up-to-date machines are used throughout. Wherever possible, all tables going through this plant are conveyed on an elaborate conveyor system which is more than 5,000 feet long. It is estimated that at any one time during the working day there are 2500 tables going through this production line. One of the largest production departments in the plant is the veneer department. Included in the equipment in use are two No. 89 Diehl tapeless splicers and one No. 900 Diehl electronic tapeless splicer. Mr. Stephen Bettinger, veneer department foreman, had this to say about the use of the Diehl splicers in his plant, "We are producing more veneer with less labor at a much lower cost with our Diehl No. 900 and our two 89's. It took six tape machines to do the same job that the three Diehl splicers are doing."



Courtesy G. M. Diehl Machine Works.

Fig. 2. Infeed end of Diehl electronic splicer at Stremming Veneer Company plant at Maplesville, Alabama. Note push button controls.

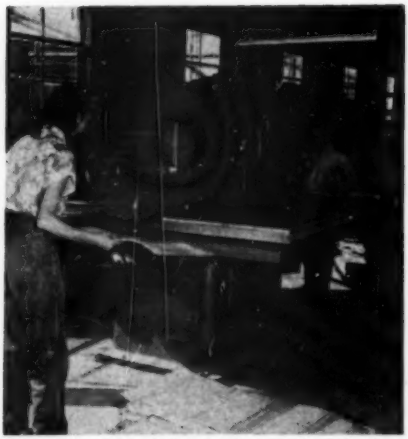


Fig. 3A. The Diehl electronic tapeless splicer at work in the Stremming Veneer Company, Mapiesville, Ala.

Mr. Roger Clapp, general manager of Mersman, had this to add on the splicers, "With the Diehl tapeless splicers we not only save the cost of tape, but also the time spent in putting it on and taking it off. We figure that these machines have more than paid for themselves in less than eight months of operation."

Stremming Veneer Company, Maplesville, Alabama: When this company was contacted in October, 1951, they had in use six No. 890 Diehl tapeless veneer splicers and one No. 900 electronic tapeless splicer. This company is one of the most progressive veneer mills in the South, and their plant facilities, machinery, etc. equal almost anything found in the northern section of our country.

Other No. 900 installations are at the Wood-Mosiac Company, Louisville, Kentucky, and at the Jamestown Veneer and Plywood Company, Jamestown, New York. There are many more No. 900 units at work throughout the woodworking industry, but we have mentioned only these few in this article.

Although there has been considerable experimentation with other methods for the continuous edge-gluing of veneer, the first flat-plane continuous electronic veneer edge gluer to be produced commercially, we are told, is the Mann-Russell continuous flat-plane electronic edge gluer, manufactured by Northwest Syndicate, Inc., of Tacoma, Washington. This machine is the result of work cooperatively carried on at the University of Washington School of Forestry and the Mann-Russell laboratories.

According to Julius W. Mann of this concern, six main objectives were considered in the development of this veneer edge gluer:

1. Veneer edge gluing should be accomplished while the wood was held in firm register edge to edge and in a flat plane.

2. Means for holding should be provided which would prevent the veneer sheet turning, skewing or overlapping during travel.

3. Thicknesses of from 1/28" to ¼" must be edge glued to the same degree

Fig. 3B. Production is speeded in bonding veneer strips at the Jamestown Veneer & Plywood Company, Jamestown, New York, with the Diehl No. 900 electronic tapeless veneer splicer.

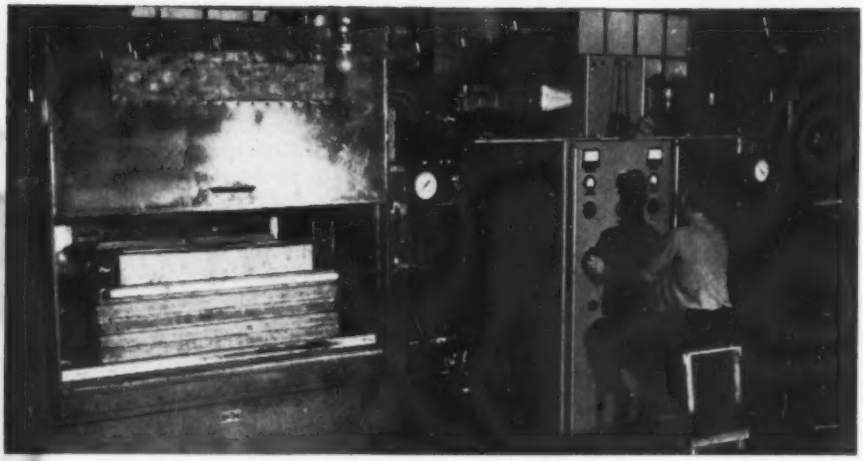


Fig. 4. Plywood electronic gluing press installation at Weldwood Plywood, Inc., Woodstock, Ontario, Canada. H.F. generator located adjacent to press and hooked up to electrodes above and below.

of efficiency without reduction of output by thickness increases.

4. Continuous and endless flow output of 103" veneers must maintain speeds to 40 or 50 f.p.m. in direction of travel.

5. The adhesive line must be solid set and stronger than wood.

6. The machine must be economical from the standpoint of power consumption and direct labor with a minimum percentage of rejects.

This machine permits narrow selected clear veneers of random widths and lengths from 4' to 8' parallel to the grain to be glued edge to edge, with the stock flowing at right angles to the run of the grain and at a continuous speed up to 45 f.p.m. Veneer thicknesses from 1/28" to ¼" can be handled in this machine, either rotary-cut or sliced.

In a typical plant installation the veneers progress from the veneer jointer and glue spreader, where edges are jointed and glued, to a lay-up conveyor. There they are aligned and carried through the veneer edge gluer to set the glue line and emerge in a continuous web of random width edge-glued veneer onto the feed table of a selective veneer clipper which automatically cuts the veneer into sheets of desired widths while the veneer web is in a flat plane, usually producing sheets of stock for plywood faces about 48" x 96".

The parallel bonding process used in this machine was developed and is owned as a process patent by the manufacturer. Bonding power is provided by a Mann-Russell electronic generator supplying just over 5 kw. of radio frequency output from a line input of about 11 kw. at full operating load. The electrode network furnishing the high frequency field to set up the glue line during passage of veneer through the machine is composed of parallel electrodes suspended from transverse bus bars across the press and between each V-belt of the off-bearing section of the

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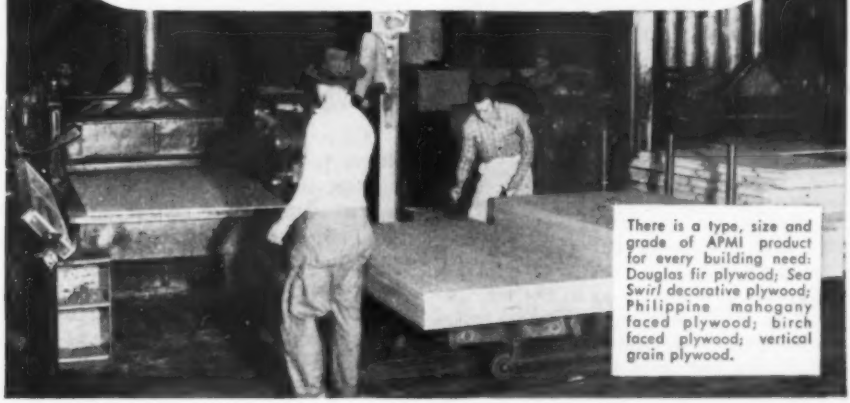

There is a type, size and grade of APMI product for every building need: Douglas fir plywood; *Sea Swirl* decorative plywood; Philippine mahogany faced plywood; birch faced plywood; vertical grain plywood.

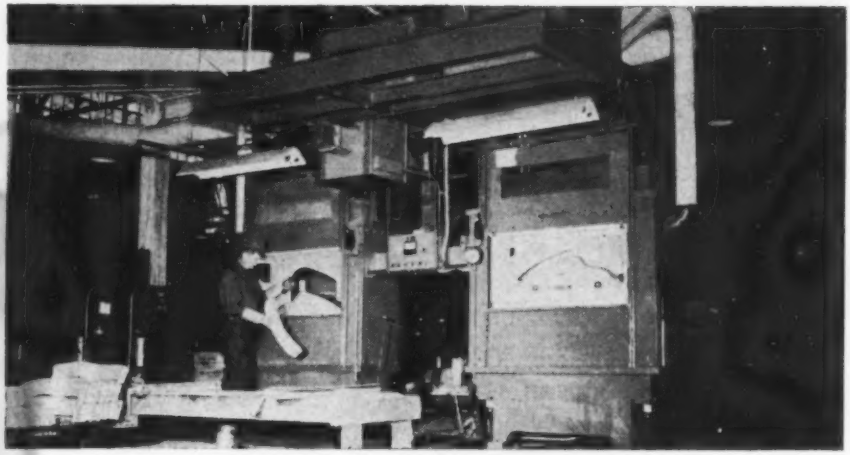

Fig. 5. A view of hard maple molds used to laminate and shape pillar blanks with compound curves with upper and lower contact surfaces made of copper to serve as electrodes. This operation is conducted at the Ford plant, Iron Mountain, Michigan.

upper unit, elongated in the direction of the travel of the veneer and riding the surface of the veneer. All glue lines lie perpendicular to the faces of the opposing electrodes to place the glue lines automatically in a position parallel to the dominant field lines of high frequency between the electrode elements.

As explained by Mr. Mann at a meeting of the Pacific Northwest Section of the Forest Products Research Society in discussing the mechanics of the press where the veneer travels through the high frequency field by means of a new mechanical V-belt drive:

"We found in the development of the electronic flat plane edge gluer that the high frequency network must not be employed as a means of applying retarding pressure; that in the fabrication of thin veneers, frictional forces in the press must be reduced to a very minimum, and that nothing less than resort to V-belts running in channels of multiple roller ball bearings would answer this latter requirement. Finally, since determination that the edges of the leading and following veneer must maintain a firm and gradually increasing pressure one against another until the setting of the adhesive, we found that not only drive and retarding sections must be frictionless so far as possible, but also that top and bottom sections should be forced toward each other by constantly exerting air pressure to maintain this increasing edge pressure to a uniform degree.

"Closely spaced parallel V-belts with driven section interlaced with and overlapping the electrode section to maintain register of the veneer while running at speed was the logical answer to the skewing problem. A rigid upper multiplicity of such intermeshing V-belts must form a rigid flat plane against which a duplicating set of structures pressed the passing sheets of veneer from below. A closing section

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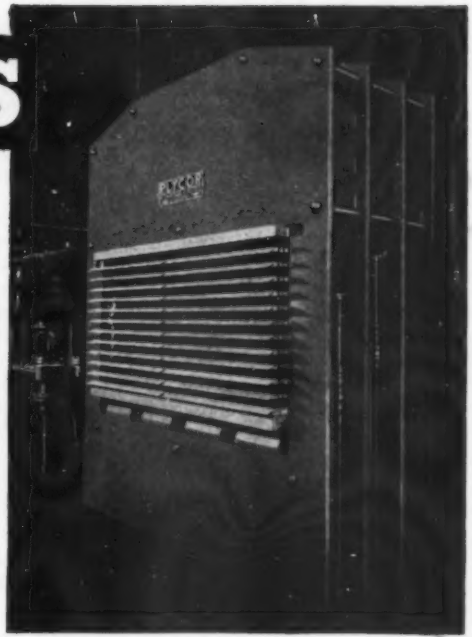

A Plycor Steel Frame Press, plate size, 106" x 66" side loading, 16 openings. Also made in sizes up to 110" x 74" with from 1 to 20 openings. Where the loading size exceeds 110", Plycor Strain Rod Presses are available.

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called a feed or speed up section with very light or kiss touch on the veneers was found as a necessary precedent to the first or driven section; it also being intermeshed with and geared to run at a slightly higher speed than the driven section.

"The upper and lower tractors between which the veneer is passed and edge pressed together are each composed of three systems each of which overlap and intermesh with the preceding one; the lower faces of the upper section, and the upper faces of the under section all lying in the same flat plane. To support each V-belt of the system in the same plane as all the others, on the lower side of the upper section, each belt has its own metal channel and rides on roller bearings placed one right after another for the entire passage between sheaves, and likewise each belt of the upper face of the under section rides its individual roller bearing channel between its sheaves."

Thus the veneer passing from the feed to the offbearing end is given firm support by the roller bearing supported V-belt faces, above and below, with the entire lower section being constantly forced against the fixed upper section by three spaced transverse hose pressure means, maintained at individually required pressure to provide firm and rigid control through individual pressure control valves. The rubber-faced V-belts provide pliable, constant edge pressure during forward motion. The driver belts are in tension while the retarding belts are in compression, with relative degree of tension being influenced by transverse hose pressure means, which are variable by the operator by remote control. The vari-speed drive rates 3 h.p. for the machine drive.

It was impossible because of geographical distance to study many installations that have been made of this new veneer edge gluer. Reports generally indicate that while speeds of over 40 f.p.m. have regularly been obtained, the 103" machine operated by a single operator without mechanical loading devices is usually operated at about 35 f.p.m.

Among the various installations reported, it was stated that the Pacific Veneer and Plywood Division plant at New Westminister, B.C., Canada, was producing accepted panels at a rate of more than 8,000 square feet per hour of edge glued softwoods with a 103" machine. A 50" Mann-Russell electronic continuous flat-plane edge gluer at Nickey Brothers plant in Memphis, Tennessee, produces 37,000 square feet of edge glued hardwoods per 8-hour shift with two operators.

Laminated Constructions and Flat Plywood

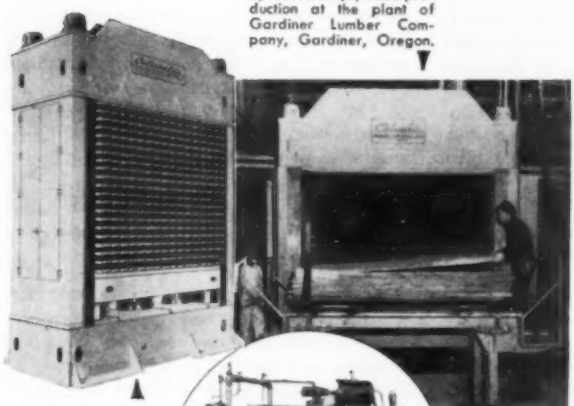
One of the earliest applications of electronic gluing equipment was its use in bonding laminated constructions and flat plywood. Since electronic heating does not depend primarily upon the action of heat soaking through the construction from the surface for setting up the glue line, heavy material may be bonded just as easily as the thinnest veneers and every square inch of glue line is set uniformly.

Investigation of electronically heated press operations to produce solid-wood laminations and/or plywood generally showed improvement in quality of product in nearly every instance over other methods. Most users reported better surfaces and flatter panels with fewer joint failures. Glue savings over former methods ran as high as 50%. Other reported economies included less space and labor, eliminating use of retaining clamps and I-beams and greatly reducing the number of caul boards, head blocks and forms required. Waiting time for glue to set is also eliminated.

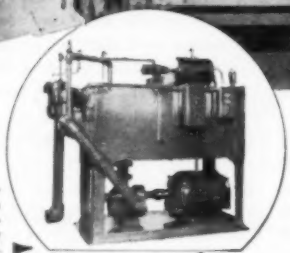
Smooth... PRODUCTION-PROVED PLYWOOD PRESSES

Columbia Hydraulic Hot Plate Press design exclusives are production-proved . . . and smooth . . . . .

One of two 4' x 8', sixteen opening Columbia Hydraulic Hot Plate Presses operated for plywood production at the plant of Gardiner Lumber Company, Gardiner, Oregon.



20 daylight Standard Columbia Hydraulic Hot Plate Press, open.



Columbia Hydraulic System showing arrangement for gravity feed to high volume pump.

Other Columbia design exclusives influence platen heating, labyrinth features, steam lines, opening and timing, pumps and pressure lines, and even use of materials.
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Consider ONE FEATURE

A high volume pump and a high pressure pump, pumping oil directly into the cylinders, operates simultaneously to close the press. At the start of the pressure stroke, the high volume pump cuts out while the high pressure pump continues without interruption. The usual drop in pressure at this change-over point is eliminated; operation is smoothed.

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So too, a special pilot operated drain valve provides for the smooth release of pressure and rapid press opening at end of cycle.

new series *Columbia* HYDRAULIC HOT PLATE PRESSES

The advantages are probably best described for this operation as stated by W. T. Owens of the Girdler Corporation in a recent publication of Cathode Press:

"Dielectric heating in this service combines the good points of ordinary cold presses with the good points of hot plate presses, without the limiting and expensive operations of either. Further, the ideal bonding temperature for each type of adhesive is attained throughout the stack — in every square inch of every layer of glue; successful conditions can be duplicated in each succeeding load. Bonding multiple layers of the thickest boards is as easy as bonding the thinnest veneers; with 6" blocks or slabs, or with plywood panels 3/16" thick — 2 or 200 glue lines — one can be done as readily as the other."

Bonding pressure is applied in the usual manner in most operations using conventional presses but with the addition of electronic or high frequency heat to set the glue while the work is in the press. A high frequency generator is located adjacent to the press and is hooked up to electrodes above or below or at the sides and ends of the press. After required pressure has been applied to the work, h.f. power is turned on and high frequency current is applied to cure glue lines for a pre-set cycle. This is automatically shut off when glue lines have been cured (Fig. 4).

Electronic gluing offers greatest advantages in bonding sections ½" and greater because of the decreased heating time as compared to conventional steam heating processes. It is usually performed with a large number of plywood sheets forming two stacks and a flat metal "live" electrode placed in the center of the lay-up and using the upper and lower press platens as "ground" electrodes. Twenty-four inch stacks are completely set up in less than 10 minutes by this method. Furthermore, conditioning periods common to conventional hot press methods are practically eliminated since reconditioning to balance moisture content is not necessary in many cases.

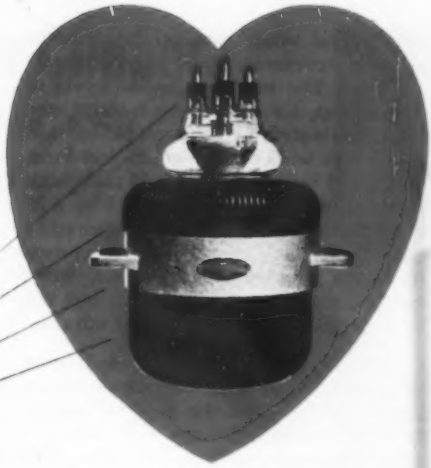
A concern manufacturing all-veneer plywood panels reported that a 1 kw. radio frequency generator, using about 600 watts, proved to be sufficiently powerful to head and cure a cold-setting glue between veneers in a heating period of 7 to 9 minutes at a frequency of 8 megacycles and a temperature rise of 100° F. above room temperature. A manufacturer of laminated structures reported production of 16 lineal f.p.m. of 5 and 10-ply laminated beam, made up of ¾" x 1¾" laminating strips, using 20 kw. radio frequency generator capacity.

Flat plywood bonding with electronic gluing was observed being done in many plants with conventional plywood presses and standard high frequency or radio frequency generators. The chief limitations to this process have been regulation of heat to prevent steam blisters and difficulty in producing a perfectly flat surface. It was impossible to select outstanding installations as all were obtaining consistently satisfactory results.

Electronic gluing in the production of laminated constructions included applications ranging from fabrication of timber sections for airplanes, ships and building construction to production of tennis rackets and hockey sticks. Ingenious jigs have been designed and constructed on the job and commercial electronic equipment manufacturers have showed equal ingenuity in the design of commercial units. Unfortunately many of the most ingenious cannot be described here because of security restrictions.

In an airplane plant where electronic gluing is used in the production of spar caps, bulkhead reinforcements and stif-

What You Should Know about the HEART of your Electronic Bonding Equipment



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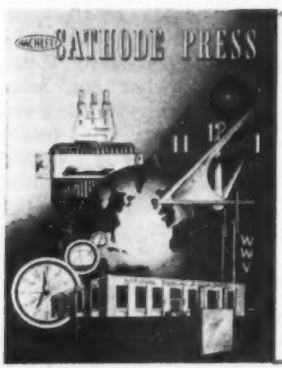

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feners, and other wooden laminations or joint structures, many ingenious jigs are used. The total lamination cycle of a spar cap, for example, is about one hour, laminated with plies of ⅜" spruce. 4 to 5 feet wide and about 25 feet long, and cured in packs of 12 to 23 plies with high frequency energy supplied by a 20 kw. r.f. generator. The time required to cure the glue line completely depends upon the number of glue lines, wood species, moisture content, etc., but the average cure takes about nine minutes.

The spar caps are laid up in a channel jig with a thin strip copper electrode positioned between the pack of spruce laminae and the channel wall with another electrode used on the other side of the pack, with short uniform thickness backing blocks which have short lengths of fire hose inserted between them and the front wall of the channel jig. Covers are hinged at the rear edge of the channel jig and act as tension members of the jig, which are lowered over the lay-up in the jig. After the fixture has been locked to close gaps between strips, the hose is inflated with compressed air under pressure of about 80 p.s.i. to apply a uniform pressure to the joints. The two strip electrodes are then connected to the r.f. generator for the application of electronic heat to cure the adhesive. A maximum temperature of 180° F. is applied when a urea glue is used; from 180° to 200° F. when a phenolic resin is used.

Electronic laminating operations at the Ford plant at Iron Mountain, Michigan, have attracted a great deal of attention (Fig. 5). This complete process has been described in WOOD WORKING DIGEST, June, 1951.

The Werlich Manufacturing Company Limited use an electronic gluing laminating process in their plant at Preston, Ontario, Canada, in the manufacture of high grade hockey sticks. Each hockey stick contains as many as 15 pieces which are glued together with resin adhesives, pressed and bonded in special forms and cured by high frequency heat. R. H. Nichols Edco generator units supply high frequency current for curing. These hockey sticks have a laminated handle with a one-piece blade reinforced by pieces of hard fiber in the heel and toe and the handle is finished off with two face pieces which cover the edges of the laminated core. An electronic press is used to clamp the fiber inserts in the tip and heel of the blade as the hockey sticks are pressed in pairs and the glue is set in 1½ minutes. A similar press is used to attach face strips to two hockey sticks at the same time in about two minutes.

At a leading sporting goods manufacturing plant tennis rackets of laminated construction, containing as many as 11 pieces in the complete assembly, are produced by electronic gluing methods. Strips of ash and decorative fiber are glue-spread and laid up on a special clamping table where pressure heads align the complete assembly. After the assembly has been clamped, a movable upper electrode of the same shape as the tennis racket is lowered into position. The total glue line of up to 8 plies is cured by high frequency heat in about 30 seconds and the racket is ready for the finish machining.

Densified wood products are also made with laminated and electronic gluing procedures and equipment. Pluswood, Inc. employs what has been called the world's largest hydraulic press to produce its high density wood products and uses one of the world's largest high frequency heat generating units for curing. It has a heat generating capacity of 300 kva, 540,000 Btu's per hour.

Electronic gluing equipment is also used in the production of densified wood propeller blades. In a typical application at a plant which makes wooden

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The Model 346 CLIPPER which meets the need for a single-knife high production machine.

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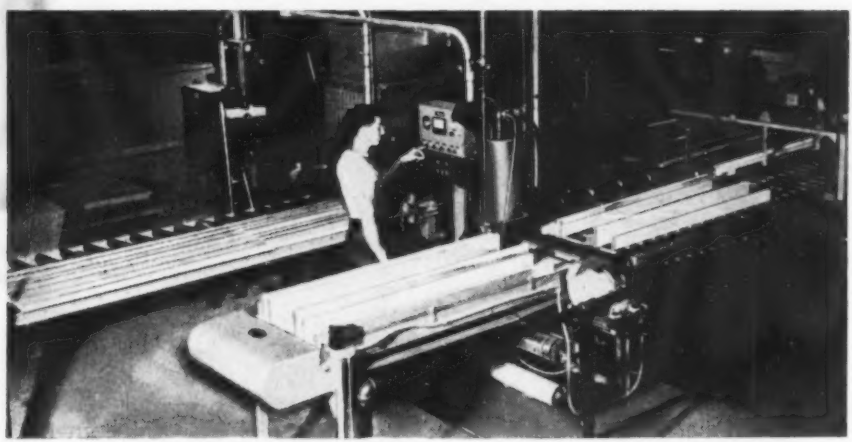
propellers for training planes the blades were laid up in a preform of ⅛" impregnated plies between spaced electrodes in the forming dies and pressure was applied in a conventional hydraulic press. After the required pressure had been reached, the high frequency generator was turned on to raise the temperature to about 260° F. in about eight minutes. It was explained that this operation took about six to eight hours in a cold setting process. In a laminating operation at this same plant glider wing bows made up of eight plies of ⅛" thickness were completely formed and cured in 8½ minutes, instead of the 4 hours formerly required.

The balance of this month's article describes a number of installations of electronic edge gluing equipment. A complete description of this process was given in the November issue of WOODWORKING DIGEST.

Based upon a "parallel bonding" process, issued to George F. Russell and Julius W. Mann, the Mann-Russell continuous process electronic edge gluer is manufactured by the Northwest Syndicate, Inc., of Tacoma, Wash. This edge gluer consists of a feed-table, make-up and pressing sections with endless belt and automatic glue spreader and is powered by a heavy duty Mann-Russell electronic generator.

In actual plant operation the off bearing end of the unit is said to run at a speed of 10 lineal feet per minute on parallel lines of 4/4 stock to produce up to 50 board feet of panel per minute solid set without marred or scratched surfaces. Automatic hopper feeds are being considered for use with this electronic edge gluer to enable the operator to keep up with its high production capacity. The machine handles any desired length of stock in thicknesses from ½" to 1½". The 63" ma-



Courtesy The Girdler Corporation, Thermex Division.

Fig. 6. Automatic spreader and lay-up system for one-man electronic edge gluing operation at Rway Furniture Company, Sheboygan, Wisconsin.

See how the new Thermatron High Frequency Generator with Automatic Power Control Speeds up Edge Bonding!

Thermatron

HIGH FREQUENCY GENERATORS AND EQUIPMENT

In the installation shown, the new 20KW THERMATRON Generator is used in conjunction with a Weldon press, which is completely shielded and guaranteed to meet FCC requirements. A new automatic tuning device delivers to the load the maximum efficiency of the generator

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They agree at the Sensenich Corporation, Lancaster, Pa., that their new 20 KW THERMATRON and batch-type press installation is really the last word for high production edge bonding. THERMATRON'S large power capacity and automatic controls quickly proved themselves in accommodating the wide variety of loads run at the Sensenich plant.

This modern high frequency generator—product of years of Radio Receptor research and development—has indicator lights and meter readings to tell at a glance the exact status of the material in work. Power and tuning automatically adjust to load conditions during the entire cycle . . . and of course all the latest protective devices are included.

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PEARL CITY PLYWOOD CORPORATION

Division of Jamestown Veneer and Plywood Corporation

Jamestown, N. Y.

Courtesy Radio Corporation of America, RCA Victor Div.

Fig. 7. Edge gluing lumber cores for desk tops at a southern plant with RCA 15 BM electronic power generator and Frisch edge bonder. Plate electrodes used in place of bar electrodes.

chine is generally used for high speed core production operations. A user reports curing 32"x48" core stock panels for table tops in 20 seconds.

Many edge gluing presses were seen which had been developed at the woodworking plant, usually with the assistance of electronic equipment engineers, where production of edge-glued stock was not sufficient to warrant the use of commercial presses of the type mentioned or when the commercial units did not conform to special production requirements. Most of these units followed the same general operating principles employing standard electronic generator units and conventional type electrodes and were designed for application of both edge and top pressure with careful timing to permit proper flattening and good bonding.

Many of these special edge bonding units are small special purpose machines and two or more units may be operated from a single generator or the machine may be made with two sides which work alternately from the same generator to permit continuous loading, bonding and unloading. Among the many ingenious electronic arrangements of this type in current use is a double electronic unit used by the Drexel Furniture Company at Drexel, N. C., to block up turning squares which has a daily production of about 3,200 blocked squares per eight-hour day.

The load in each unit depends upon the size of blocks and squares but averages about eight pieces. Clamping pressure is applied by air cylinders, with edge pressure being applied between a stationary mounted cylinder and an adjustable back plate and top pressure provided by a platen affixed to an air cylinder to exert downward pressure as it swings down on the stock from a top section pivoted by a beam fastened at the base which is operated by another air cylinder. All three cyl-

Fig. 8. Special small post gluing press developed by Electronic Heating Corp. for gluing up wood heel stock at New England Wood Heel Company, Amesbury, Mass.

1. 8 Powered feed rolls
2. No arbor or table adjustment
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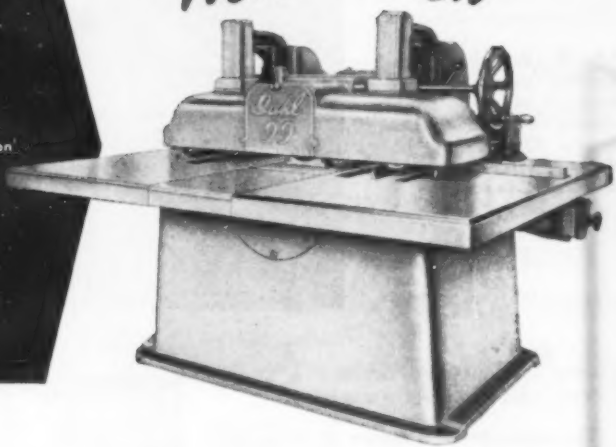

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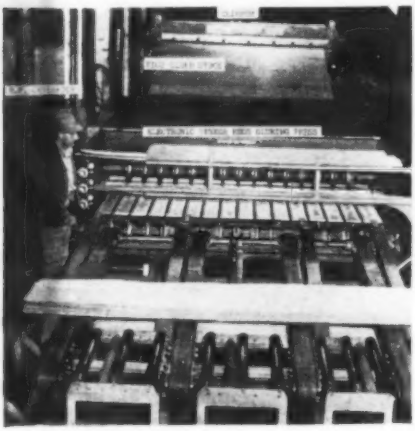
Fig. 9. Bell high frequency edge gluing press is used for panel gluing in plant of Dominion Electrohome Industrials Ltd., Kitchener, Ontario, Canada.

Courtesy Perkins Glue Company.

inders are operated through a single 3-way valve control switch.

The squares and blocks to be glued are spread and aligned in the bed of each press unit on an aluminum plate which serves as one of the electrodes. Since the top air cylinder is limited by the pivot of the top section, the bed base is adjustable vertically for various thicknesses and the edge pressure clamping mechanism is adjustable to accommodate different widths and num-



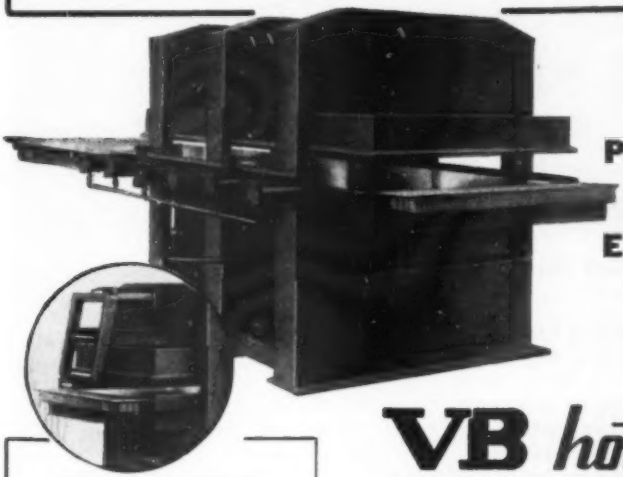
Courtesy Northwest Syndicate, Inc.

Infeed end view of Mann-Russell electronic continuous process veneer edge gluing press. Rollers move jointed and glue-spread veneer from jointer against backstop to flush one end. Flat belts convey stock to operator's loading position adjacent to speed up lay-up conveyor on which stock is laid.

Courtesy Northwest Syndicate, Inc.

Veneer off-bear man clips and stacks edge glued veneer from electronic edge gluing press. The entire edge gluing and clipping operation requires but two men, the loader and the off-bear man.

VENEERED PANELS IN ONE OPERATION!



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VB hot press

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The pressure attachments, as shown in the photo, are side and end clamping units fully synchronized with the curing cycle of the press. At a touch of the starting button the entire unit moves into operation and the core stock, crossbands, front and back of the panel are glued into a single unit. This type of operation cuts gluing and material costs, eliminates shrinkage which causes sunken joints and speeds up production.

THE "VB" PRESS ALSO FEATURES:

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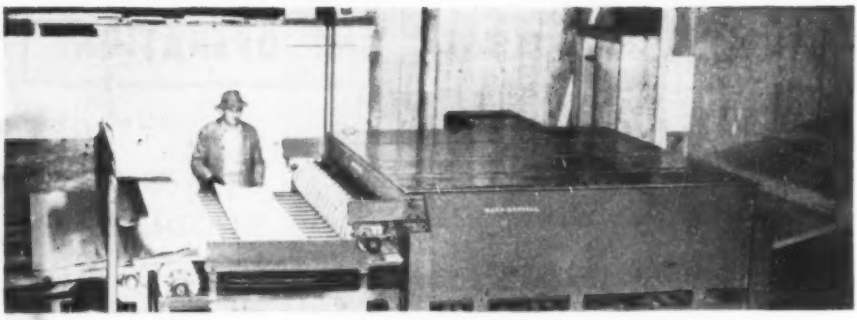
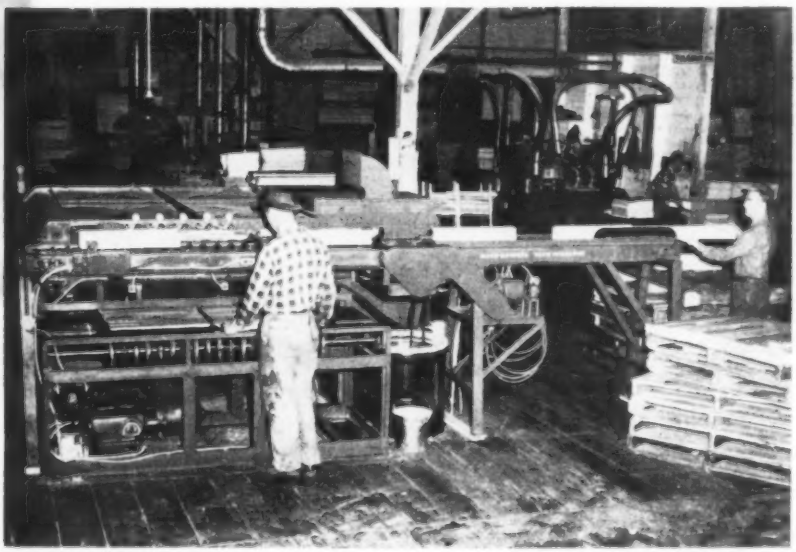


Side view of Mann-Russell electronic veneer edge gluing press shows method of off-bearer to clipper.

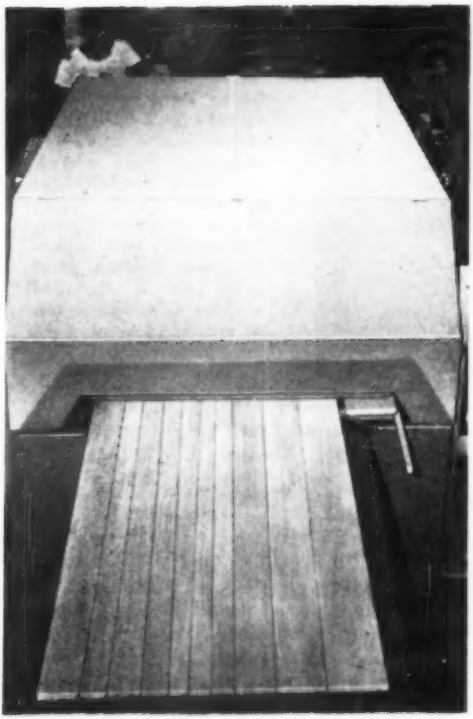
ber of pieces to be glued. The top platen is covered with aluminum for stock contact and serves as the upper electrode. A 5 kw. Westinghouse electronic generator supplies power for both units.

In operation of this electronic block machine the bed is loaded and the first air cylinder is actuated to apply edge pressure, the second cylinder brings the top section over the load, and the third exerts downward pressure and sets up proper electrode contact. As one unit load is being bonded electronically, the other unit is loaded.



Courtesy Northwest Syndicate, Inc.

Infeed end of electronic lumber edge gluer with conveyorized, electric eye controlled glue applicator.



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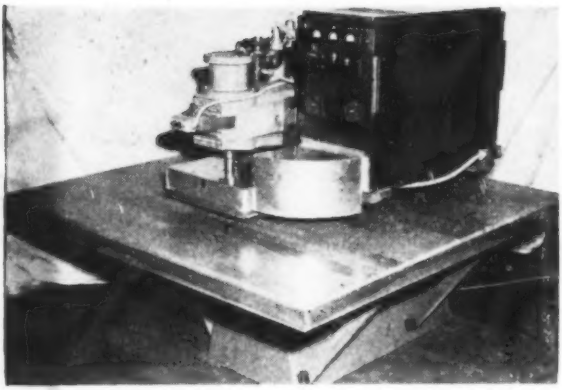

Electronic plywood repatch unit is supported on the side of standard Globe "gooseneck" with specially designed Mann-Russell patcher electronic head which replaces conventional hot plate. Curing cycles of 7 to 10 seconds, using waterproof resin adhesives are reported. Steel table top is replaced with hardwood table top as means to helping reduce radiations.

When the curing cycle has been completed, power is switched over to the other unit and the blocked squares are removed to permit the unit to be reloaded. This permits practically continuous operation as unloading and reloading cycles closely approximate the curing cycle.

Another of these special edge bonding units is in operation at the Foster-Lotham Mills, Oshkosh, Wis., for the express purpose of gluing up the bottom rail of panel type doors. One operator produces 1500 assemblies per eight-hour day. This machine was manufactured by the Bell Machine Company.

What is probably one of the most completely automatic processes ever devised for electronic gluing of panels in a continuous operation with an automatic glue spreader and layup machine is that developed at the Rway Furniture Company plant at Sheboygan, Wis. Using integrated handling, gluing and layup equipment designed and manufactured by the Rway affiliate Reiss Manufacturing Corp., all panels are produced on an automatic basis. The

Off-bear end of 63" wide continuous Mann-Russell lumber edge gluer running at speed of 10 lineal feet per minute on parallel lines of 4/4 stock 26" long with grain.

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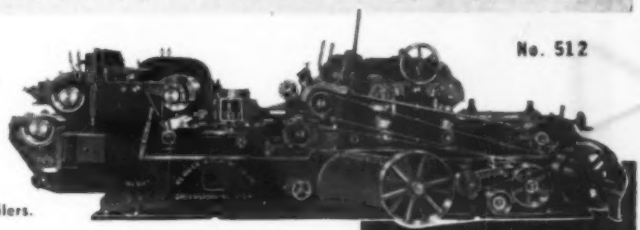
Newman

No. 512



Capacity: 16" and 24" wide, 8" thick.
Speeds up to 325 feet per minute.
8" dia. cutting circle.
Six 12" dia. feed rolls.
Single and double profilers.

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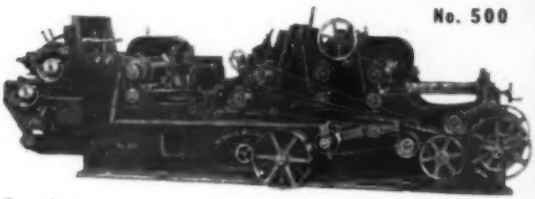

Capacity:
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The ball bearing NEWMAN 71 (shown below) will grind all sizes of cutter heads. Table is 33" long by 9" wide with horizontal travel of 25" and is heavily ribbed to maintain accuracy over entire travel. Maximum cutter head swing is 11".

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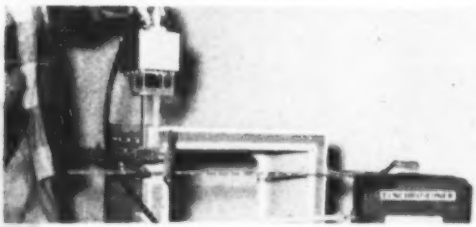

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- **1943-44** Application of Radio Frequency to Invasion Glider Mfg. Origination of Edge Gluing Furniture Core.
- **1944-45** RF Application to Plywood Jettison Gas Tanks for Fighter Planes. Laminating Compound Curvatures (RF glue curing).
- **1945-46** Radio Cabinet RF Gluing Furniture Assembly.
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operator is required only to load stock on the feed conveyor and remove the finished panels for very efficient one-man operation. Daily output runs up to 3,250 feet, with panels being glued in multiple lengths or widths, or both.

Stock for the panels is placed edgewise on a feed-belt conveyor for automatic feeding over the glue spreader where glue rolls apply glue while the stock is in transit. This spreader has a water-cooled reservoir and glue pot to keep the glue at the right consistency. The conveyor operates with an electrical system interlocked with the press and a 10 kw. Thermex high frequency generator to assure the proper flow of work. A pusher receives the edge glued stock from the glue rolls, turns the pieces on their sides and deposits them onto cross feed chains. These chains move the pieces onto the

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feed table and re-assemble it for bonding (Fig. 6).

As the feed table ram starts to move the panels forward into the electronic bonding unit, the cross chains drop below the table. This forward movement simultaneously ejects the previously cured panel. The electronic press closes automatically and as pressure is applied to the panel, electronic heat is supplied by the generator, heat and pressure are held for a pre-set period until the glue lines are cured. Then the generator is automatically turned off, pressure is released and the press is opened to permit the cycle of operations to continue.

The electrical circuit is set up easily and quickly by means of a cocking switch convenient to the operator's foot. Curing cycles of less than a minute are required to bond the individual panels.

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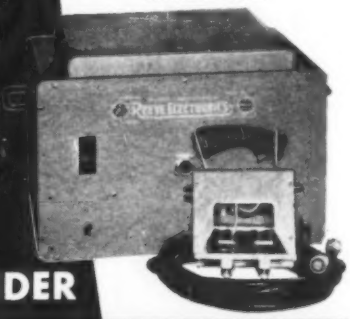

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varying from 40 seconds, depending upon wood species and moisture content of the stock being glued. When load sizes are changed, setup time is less than five minutes.

A rather interesting electronic gluing application in a southern plant for edge gluing of lumber cores for desk tops used an RCA 15 BM electronic power generator (15 kw.) for setting the glue line and a Frisch edge bonder for pressure and bonding (Fig. 7). One of the unique features of the applicator was the plate electrodes used in place of the bar electrodes usually found in applications of this type. This feature, together with higher power than is used in most edge gluing units, resulted in a complete setting of all the glue rather than the spot glue setting, obtained with bar electrodes.

Another unique press installation

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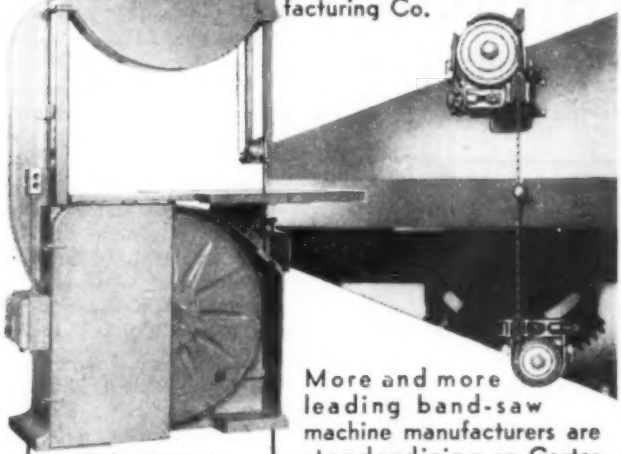
Says Crescent Machine Division, Rockwell Manufacturing Co.



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which operates upon the electronic edge gluing and laminating principles was a small post gluing press, developed for the New England Wood Heel Company at Amesbury, Mass., by the Electronic Heating Corp. for gluing up short thick posts or panels from relatively thin lumber. This concern salvages all edgings from their 7/4 and 8/4 stock, glues up these pieces into relatively wide panels in this press, and rips the glued-up panels to be utilized for wood heels (Fig. 8).

Canada is far from being backward in this field. Canadian plants use a considerable amount of electronic gluing equipment, chiefly of American design, and Canada's Forest Products Laboratories Division has been and still is engaged in extensive research on dielectric heating to secure basic and

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practical knowledge of principle, operation and application.

At the plant of Therma-Kor Industries, Kitchener, Ontario, Canada, manufacturing solid-lumber cores, glued-up stair treads and dimension, the heart of the whole production system was a Raymond dielectric press serviced by a Thermex 8 kw. high frequency generator. A frequency changer is used here to step up current supplied to the h.f. generator from 25 to 60 cycles. Coupled with a selective voltage control unit, this arrangement provides trouble-free operation of electronic equipment. The pressure and glue-setting cycle varies from 35 to 40 seconds for 4/4 stock, depending upon species, thickness and condition of material, and from one to two minutes for 8/4 and thicker material. The press has maximum capacity for panels of 60"x30" and up to 3" in thickness.

A Bell high frequency edge gluing press was found at the Dominion Electrohome Industries plant at Kitchener, Ontario (Fig. 9), being used for electronic panel gluing and a tip here resulted in the observation of a different electronic gluing application at the plant of Rubberset Company, Limited at Gravenhurst, Ontario. Another Bell electronic edge gluer is used here to glue up multiple paint brush blanks. Wing and grip members are automatically fed through a glue spreader, with glue being applied to both sides of the grip, and assembled in plywood forms. The grip is cut to double-length of the paint brush handle and a wide wing is glued to either side of the grip at the center. After gluing, these units are cut in half to make two handles. Four plywood forms make up a press load and the gluing cycle is about 1½ minutes.

A special continuous plywood molding machine for producing formed chair seats and backs is in operation at MacCraft Industries, Sarnia, Ontario, Canada. It is built somewhat on the

principle of a rotary table automatic shaper. MacCraft designed and built the machine, Bell supplied the generator.

Investigation of Edco h.f. generating units seen in some plants disclosed the manufacturer to be R. H. Nichols, Limited of Toronto, Canada. Mr. N. A. Smith of that concern advised us that for the past three years his concern has specialized in the manufacture of h.f. generators for use in the sealing of plastic sheet and preheating of plastic preforms. He did state, however, that while the plastics field had required most of their efforts, R. H. Nichols was fully aware of the current increased demand for electronic gluing equipment and hoped to renew their activity in gluing wood in the near future.

SOUTHERN PINE STORY

The woods, the mill, the men who work with the product of the Southern forests—all of these are a part of "The Southern Pine Story," published by Southern Pine Association, National Bank of Commerce Bldg., New Orleans, La.

With vivid text and colorful illustrations, the 32-page publication describes the products, planning and progress of the industry. In the book's own words:

"It is the story of the supreme structural wood of the world; the story of the oldest business activity on this continent; a story of enterprise and vision and achievement in the utilization of a great natural resource. It is a story of service to the nation's home builders and wood-using industries. It is a thrilling chapter in the industrial history of America."

One of the early sections of the booklet explains exactly what southern pine is—where it grows and what its species are. This chapter also points out some of the uses of southern pine lumber.

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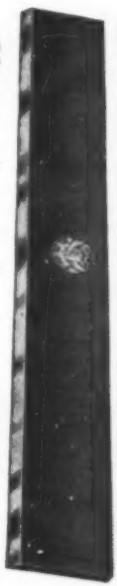

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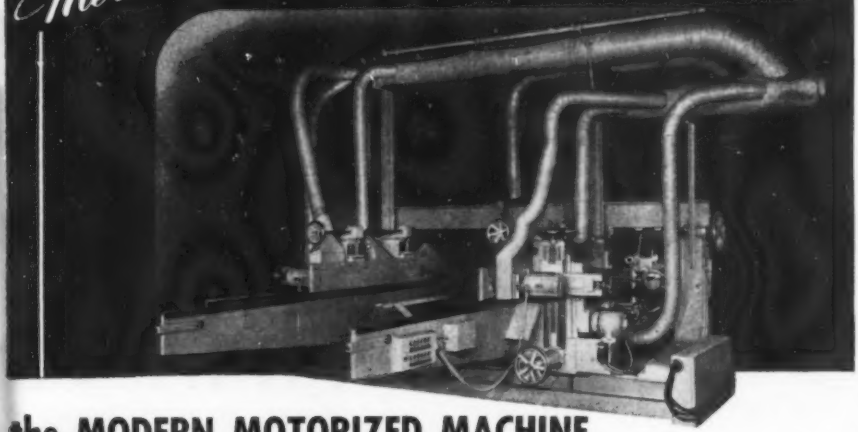

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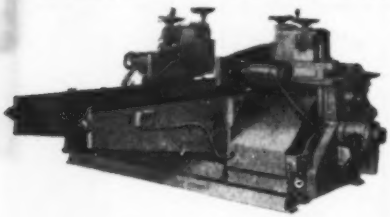

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TYPES OF PLYWOOD

Part 13

PLYWOOD IN SIMPLE CURVATURE

By Thomas D. Perry

THIS series of articles, which will be concluded in the January issue, has demonstrated that plywood, in its many designs and constructions, is a most versatile material and lends itself to a multitude of applications.

Plywood is particularly useful in the development of curved surfaces, and in that regard, outdistances products that can be made from normal solid wood. It is a characteristic of normal plywood that the alternate layers be at right angles to each other, and equally balanced or distributed on a center line. The problems of making flat plywood that can be curved, or of making curved plywood, may require departures from this standard, sometimes with the grain of the adjacent layers at 30°, 45° or 60°, or, in rare instances, with parallel grain directions in all layers.

The various types of curvable or curved plywood, both for simple curvature (curved in one direction only) can be classified as follows:

A. Thin plywood, made flat, to be curved without heat.

B. Plywood of all-veneer constructions, made flat, to be curved under heat.

C. Plywood of lumber core constructions, made flat, to be curved by recessing the concave side.

D. Plywood of all-veneer constructions, to be made in curved forms.

E. Plywood with lumber cores, to be curved as it is glued.

There are, of course, combinations of these types, as well as exceptions, but these classes represent most of the important techniques in curved plywood.

A. Thin Plywood, Made Flat And Curved Without Heat

This refers especially to standard stock panels of all-veneer constructions, used for structural applications, where curves are relatively wide sweeps, and where the plywood can be rigidly held in final positions by supporting framework. An example is the use of curved concrete forms of plywood, for arches, for large columns, or for buttresses. Another example is the use of both concave and convex curved plywood in modern interiors, where sharp corners would detract from the attractiveness of the design motif.

Flat plywood of standard constructions will permit the following degrees of curvature, according to data presented by the Douglas Fir Plywood Association:

Plywood Thickness	Maximum Radii	
	Lengthwise	Cross-wise
1/8"	0' - 10"	0' - 6 1/2"
1/4"	2' - 0"	1' - 3"
3/8"	4' - 6"	3' - 0"
1/2"	8' - 0"	6' - 0"
5/8"	10' - 0"	8' - 0"
3/4"	12' - 0"	10' - 0"

Lengthwise and crosswise refer to the grain direction of the outer layers of veneer.

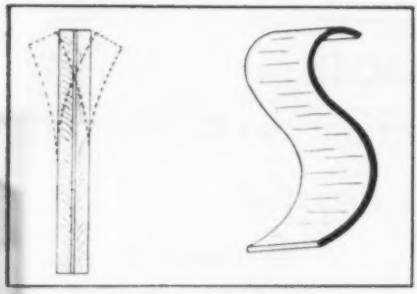

Fig. 1. Flexible plywood for sleighs.

While this table was particularly developed for fir plywood, it is reasonably applicable to hardwood plywood, in all-veneer constructions, but not to plywood made with lumber cores.

The plywood construction shown in Fig. 1 is a curious type, with a very thin center and relatively thick outer veneers. The outer veneers must be "loose" cut and of relatively low density species. The result was a very pliable sheet of 3-ply plywood, adapted to the "S" bends required for dash boards in old fashioned sleighs, which were bolted to forged iron frames. In those distant "horse and buggy days" many coats of paint were applied on all vehicles, and the inevitable cracks, caused by bending, were well filled with paint.

Plywood of All-Veneer Construction, Made Flat And Curved Under Heat

The ductility of plywood (casein or resin glued) under heat is a distinct aid in reducing the radius of curvature below that given in the above table. It is important that heat be applied at the point of curvature; to permit easy handling; to localize the curves; and to produce curves of uniform contours. The bending machine shown in Fig. 2 is designed for this type of work, and is provided with a heated cylinder, which is interchangeable for diameters ranging from 2" to 10". An adjustable stiffener bar is provided above this cylinder to counteract deflection in the smaller cylinders. Below the cylinder is a "V" shaped valley, in which the two sides of the "V" are curved inward, to give the proper contact points, automatically, when using any of the sizes of cylinders provided. The four back gauges are provided to permit forming of a continuous rectangle, as in the case of a plywood frame for a suitcase, or a round cornered design for a chest or box. There are two sets of pneumatic rams (or jacks) below the cylinder; the two smaller rams clamp the plywood firmly against the heated cylinder before the curving begins; and the three larger rams make the curve. These operations are synchronized and controlled by foot levers as shown at the bottom of the photograph.

Plywood, ⅛" thick, can be readily curved to a 1" radius (2" diam. cylinder) and requires no reinforcing on the concave side. It is claimed that plywood up to ¼" thick has been successfully curved to a 1½" radius (3" diam. cylinder), but requires a piece of reinforcing veneer on the concave side. This reinforcing strip is coated with a resin adhesive, which is curved by the heat of the cylinder. This reinforcement keeps the curve from opening up in subsequent service. It is usually good practice to apply a steam spray over the area to be bent just before making the curve.

Typical curved corners are shown in Fig. 3. In the case of plywood thicker than ¼", which must always be of all-veneer construction, the radius of curvature must be correspondingly increased.

C. Plywood of Lumber Core Construction, Made Flat And Recessed On the Concave Side

Plywood with lumber cores, usually having a total thickness of ⅝" to 1⅛", requires special procedures for bending. Several typical examples are given in

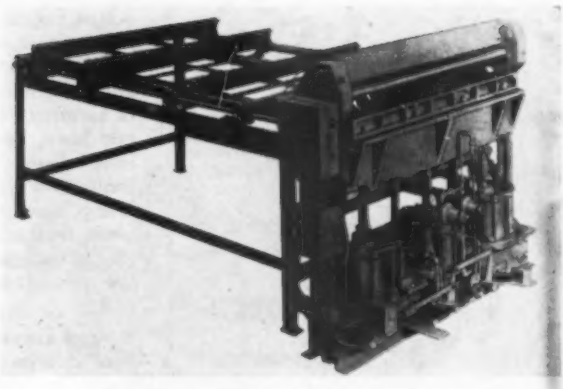

Fig. 2. Bending machine for round-cornered plywood.

Courtesy Handy Manufacturing Company.

Fig. 4, in which the original cut-outs on the concave side are indicated at the right by dotted lines. It is important that no type of cutting goes deeper than half way through the cross band, in order to prevent a lumpy bend, or possible breakage. The aggregate widths of all saw cuts must be about 25% more than the difference between the width of the inside and outside curve.

Sketch A shows a special molding, glued, and often bradded in place, and a small brace is often tacked across the corner to preserve the shape until the glue has set. Sketch B accomplishes the same result, but in a different way.

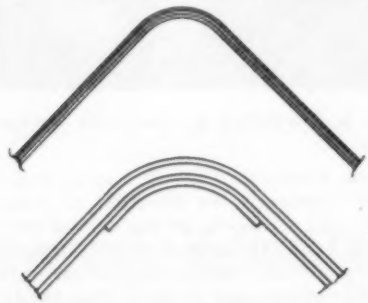

Fig. 3. Round corners in plywood bent under heat.

The block on the concave side is glued in place and held by screws as indicated, requiring no bracing. Sharp saws are needed to avoid tearing out intermediate sections, and all gang saws must have the same cutting diameter. Sketch C is an example of an all-veneer construction, where the curvature was sharper than could be made safely, without recessing, in the bending press illustrated in Fig. 2. This type of all-veneer construction is bent in this press, and the reinforcing veneer glued in place at the same time. A similar reinforcing strip of veneer can be used in type B, instead of the screwed block, using the bending machine.

These three types of curved corners are usually made with the grain of the face veneers running around the curve, although, with care, such bends can be made when the wood grain is parallel to the axis of curvature. It is usually desirable in such bends, as are indicated in A, B and C, to utilize a steam spray over the area to be curved, to reduce the hazards of breaks in over-dry face veneers.

An unusual type of plywood, shown in Fig. 5, was offered to the trade a year or more ago, but did not prove popular.

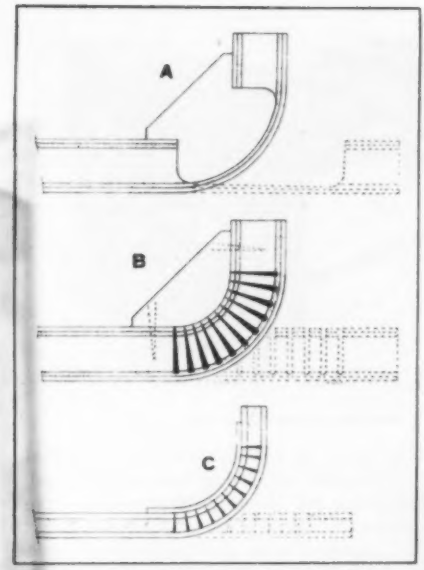

Fig. 4. Recessed curved corners which are reinforced.

The process was developed in Europe and involved saw slitting the core before gluing, followed by gluing a crossband and face veneer on the slotted side. The unslotted thickness of the core was then planed off, leaving an unbalanced 3-ply construction with slotted back. It could be used for concave or convex curves, but was so very flexible that a rigid frame was required. It is believed that the difficulties involved in operating wide planers made the costs excessive and retarded the sale of what would appear to be a useful type of standard plywood which could be curved on the job by regular carpenters.

To Be Made in Curved Forms

Before the commercial availability of synthetic resin adhesives, in the late 1930's and early 1940's, most of the curved plywood for use in furniture and household equipment was made between pairs of curved forms, usually of laminated wood, which were glued and bolted together. Most of the glues used during this earlier period (before resins) were neither water nor heat resistant, and many of the above techniques of bending or curving flat plywood had not been developed; nor would they have been useful, because of the limitations of the glues then in use. Many woodworking shops find these older methods still meet their requirements, especially where production runs are of moderate size.

One of the basic principles in this type of curving was the fact that pressure in one direction only, as is customary in most plywood presses and clamps, could be effective over 90° of a circle, or its equivalent. In other words it would be effective at an angle of 45° between the direction of pressure, and a tangent on the curved plywood, as is indicated in Fig. 6. Beyond this point one cannot depend on uniformly strong and durable glue joints.

Fig. 5. Pre-slotted plywood with lumber core.

These forms, used in pairs, were of the order of the design indicated in

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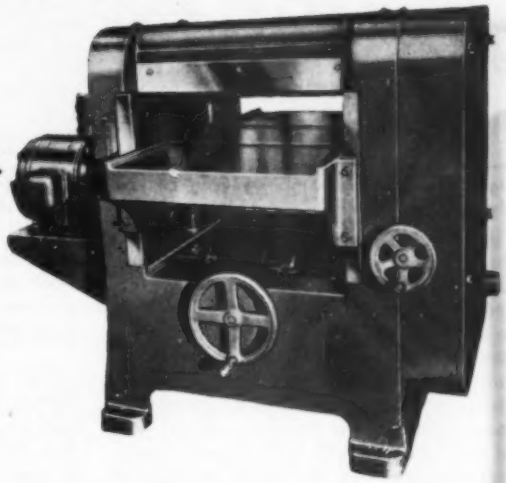

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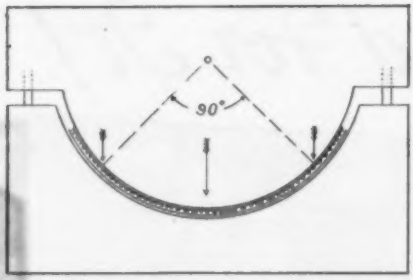

Fig. 6. Pair of forms for making curved plywood.

Fig. 6. The engaging pins, shown in this sketch, are not required on true circles, which are self centering, but are often essential in irregular curves, in order to secure uniform pressure. A pair of forms, made for ¼" plywood, could not be used for ½" plywood, nor the reverse, since the arcs of the curvature must have a common center. One of the fundamentals, in these all-veneer constructions to be glued in curved forms, was that any veneer layers to be curved across the grain must be as thin as practicable, and that the maximum permissible thickness of layers, with grain parallel to the axis of curvature, should seldom exceed ⅛". A typical construction is shown in Fig. 7, which was made in large quantities for phonograph doors in the early 1930's.

The typical pair of forms, shown in Fig. 6, when made of metal, can be used in hot pressing with resin adhesives. Heat can be applied by cavities in the forms for steam, or by contact with steam heated platens. Forms of wood can be lined with sheet metal for electric heat, either of the resistance or high frequency types.

The plywood, with corrugations, as shown in the cross section of Fig. 8, is a new product with interesting possibilities. Not that corrugated plywood itself is new, but this particular item has

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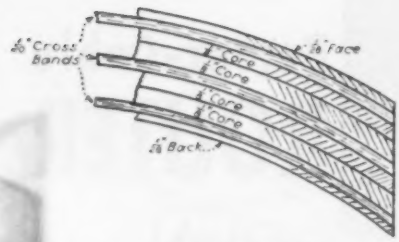


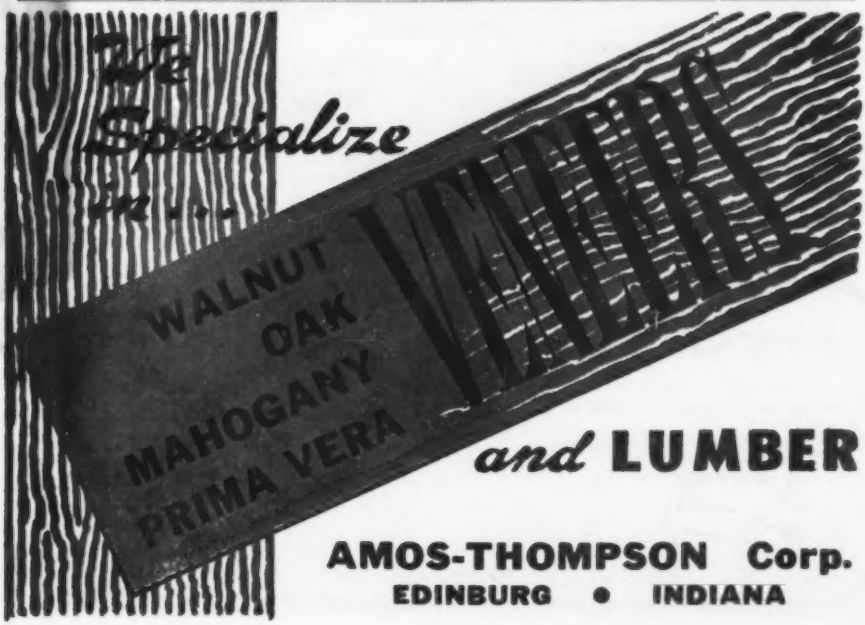
Fig. 7. Curved plywood—9-ply, 11/16" —in all-veneer construction.

the unusual feature of being faced on both sides with thin sheets of aluminum, rather thicker than foil, and designed to be used as a roof. The pioneer work on this product has been carried out in Brazil, and arrangements are underway for its manufacture and sale in this country. This plywood, some 6 mm. thick, is 5-ply, not counting the metal facings, and is glued in specially designed hot presses, using Tego resin film, which assures complete waterproofness.

Similarly corrugated plywood, with figured veneer or plastic faces, can be produced by the same process, and affords a lightweight material with exceptional stiffness for wall paneling, partitions and other decorative purposes.

E. Plywood With Lumber Cores To Be Curved As It Is Glued

The cores for this type of curved plywood are band sawn from blocks of laminated wood, as illustrated in Fig. 9. In the left sketch, using a single band saw cut for the face and back of the core, it will be noted that the cores are thinner at the ends than at the center, which is often permissible, as in drawer fronts. Theoretically the aggregate width of the saw kerf should be sufficient to accommodate the four layers of veneer which are to be inserted to make it a 5-ply construction. These, including 1/24" for crossings and 1/28" for



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faces and backs, will add up to somewhat over 1/8", but the cushion effect in the end wood of a softwood core will usually justify the use of a 3/32" kerf.

Such sawn core units are kept in sequence after sawing and the top and bottom segments are used as forms in clamping. In gluing these cores into plywood, the cross bands are spread with glue in the normal way, and a separator sheet of wax paper placed between the adjacent face and back to neutralize any adhesion that may occur due to the glue's striking through the veneers. The glue spread must be generous because of the high absorptive character of the end wood cores.

The sketch on the right in Fig. 9 indicates a different band sawing technique, which provides for a curved core of equal thickness throughout. The resulting crescent-shaped fillers, which are shaded dark, also must be kept in sequence, as are the cores from each block. These fillers are discarded after use, and new ones cut from each block. This use of crescent-shaped fillers requires from 25% to 35% more core stock and is only employed where uniformly thick curved plywood is re-

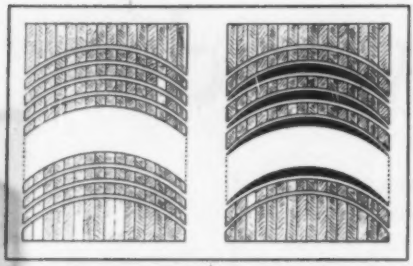

Fig. 8. Corrugated plywood faced with aluminum.

quired in special applications.

While such band sawn cores are usually cut across the glue laminations, as shown in Fig. 9, there are instances where the band sawing is along, or nearly along, these laminated joints.

These types of band sawn cores are usually employed for the so-called "serpentine" drawer fronts, as well as for a variety of special curves, as they may be required for convex and concave effects.

Conclusions

It is to be noted that many of these curved plywood designs can be made from standard flat plywood, obtained either from warehouse stock, or by normal procedures in local or plywood factories.

The making of especially curved plywood always poses the question of the amortization of the cost of the forms. The habit of designers to promote exclusive patterns, which may be changed from season to season, presents another cost problem, and often leads to rather small production runs from rather costly forms. Hence the use of curved plywood develops both mechanical and economic perplexities, which require careful study and are likely to cause a few headaches somewhere along the line.

Fig. 9. Band sawn block cores for curved plywood.

It should be kept in mind, as stated in the introduction, that there are combinations, cross-links and adaptations of these various types and processes, which still demand ingenuity, skill and experience, qualities which have been characteristic of competent woodworking management for many years.

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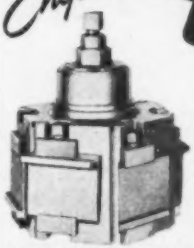

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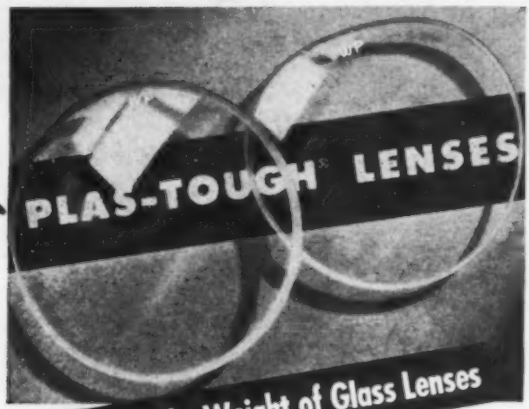

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SHAPING the Woodworker's Attitude Toward SAFETY

"To fire a man takes no ability, but to correct him by the intelligent use of discipline is a mark of good leadership."

THIS statement very well expresses the crux of the matter where safety training is concerned. How very much simpler to dismiss the employee with a bad safety record than to correct his attitudes and his habits. Safety is an attitude and a way of working. It must be developed from top management right on down the line. This thought is very well expressed by Roy E. Johnson, safety chairman and personnel supervisor of the Kroehler Manufacturing Company's plant at Kankakee, Illinois.

"A part of management's responsibility is a definite obligation to establish reasonable rules of procedure in conduct whether they pertain to quality, quantity, engineering, training or transfers. All such rules and procedures are established after past experience has proved their necessity. Safety rules are no exception.

"It is the responsibility of management to operate our plant in such a manner that we can produce goods and services which are in demand, at a price that is attractive to the consumer. Since violation of safety rules and regulations shows a lack of control and results in higher costs, it is only reasonable that all such rules should be impartially enforced.

"It is also the responsibility of management to see that every machine is properly guarded and that working conditions are conducive to safe practices. All accidents are caused; and, insofar as management can control the cause, we have a challenging opportunity to keep our people from getting hurt. When management has fulfilled its part in the physical aspects of the plant and careful training of the employee, it then becomes the responsibility of the worker to cooperate fully and establish safe working habits. Such things as absent-mindedness, recklessness, nervousness, willful disregard of instructions or being unconvinced that his own method is unsafe, are some of the reasons why a worker gets hurt.

"We have given our foremen the full responsibility for safety in their own departments. They are to see that every employee is thoroughly instructed in all safe methods pertaining to his job,

and all hazards should be pointed out.

"Follow-up is very important in order to see that the employee is doing his work in a safe manner. For example, a worker has been told to wear goggles when operating a grinding wheel. Then it is the foreman's responsibility to see that he wears them. If he does not wear goggles and gets hurt, it is as much the foreman's fault as the worker's. When a foreman notices that an employee is disregarding safe methods or practices, he should immediately call the worker's attention to the violation and seek his cooperation by further counseling and instruction. Our foremen are instructed to follow this plan with insistence that the regulations be followed. A copy of the written notice which the employee receives is placed in the worker's personnel file; and the foreman is instructed to tell the employee that subsequent violations will result in a transfer, time off without pay and finally a discharge.

"We feel that the key to the success of obtaining compliance with safety rules lies in the uniform practices within each department of our company. Fairness and impartiality on the part of management is necessary to obtain the best results. When an employee is disciplined for safety or for any other cause, he should be led to understand that he himself has brought on the penalty. Failure to carry out discipline is demoralizing to the whole plant. If an employee finds he can 'get by' with unsafe practices he will continue to disobey and others will follow his example."

Indirect Accident Controls

The information in this section of our article is taken from "Injuries, Their Causes and Controls in the Woodworking Industry," a thesis by Martin H. Saltz. In this particular chapter of his thesis he emphasizes methods of teaching safety to the new employee.

Employee education can be divided into two general classifications—(a) pre-employment education and (b) employee education. Pre-employment education includes emphasizing the importance of safety to the new employee. Possibly a plant safety manual has been published. If so, a copy should be given to the job applicant. A bulletin board carrying plant safety records, awards and safety literature should be placed where the new employee will be certain to see it. Every possible effort should be made to determine the accident proneness of the applicant. Aptitude tests, physical examination, interviews and accident records all help to determine the job at which the prospective employee will be able to work with minimum danger of an accident. When the new employee is to do work for which he is not trained, job training is necessary.

It is desirable to have the safety director or foreman discuss accident prevention with all new employees. As soon as possible after employment begins, the following subjects should be discussed:

a. An outline of all plant safety rules and policies. Here the employee has the opportunity to clear up questions he may have on the subject.

b. Description, use and care of safeguards and protective equipment furnished by the company.

c. The necessity of reporting injuries, no matter how slight, to the medical or first aid department.

d. Illustrations of typical plant hazards and previous accidents.

e. The individual responsibility on the part of each employee in carrying out the safety program.

f. Specific hazards the employee will meet in his work. There are a number of ways available to educate the

new employee. They are, however, equally effective for older employees.

One of these is the safety meeting. Meetings of this type are usually aimed at some specific group. The first meeting should be one of plant executives. Here the business to be discussed would be the general accident prevention plan; attitude of management; responsibility of foremen; frequency of reports on safety and importance of all employees receiving immediate first aid when necessary.

Following a meeting for management, a mass meeting should be held for all employees. Here the accident prevention program should be announced. If the employee body is too large to be controlled easily at a single mass meeting, it becomes advisable to hold the meetings by departments.

Under certain arrangements it is desirable to organize a plant safety committee. The material which can be used at this type of a meeting is quite varied. Novel presentations emphasizing aspects of safety, often taken for granted, are generally very helpful. The smaller the group the more effective the meeting.

After a safety program has been set up, it can be efficiently carried on by the work of an active safety committee. This committee might be made up of several employees—a foreman, a safety director and a representative from the shop. The members of this committee should be replaced at regular intervals with employees who have not yet participated. In this way every employee will have been active in the safety program.

The duties of such a committee have been suggested as follows: (1) to make regular monthly inspections for unsafe conditions and practices; (2) to warn against dangerous practices; (3) to investigate all serious accidents; (4) to help improve cooperation between management and employees; and (5) in interpret and instruct in safety rules.

Methods of inspection, safety rules and forms to follow in reporting accidents will be discussed in a future issue. Constant supervision over the entire safety program is necessary to guarantee its functioning effectively and continuously. Maintaining a safety program does mean good leadership, but it can save lives, reduce costs, and increase production.

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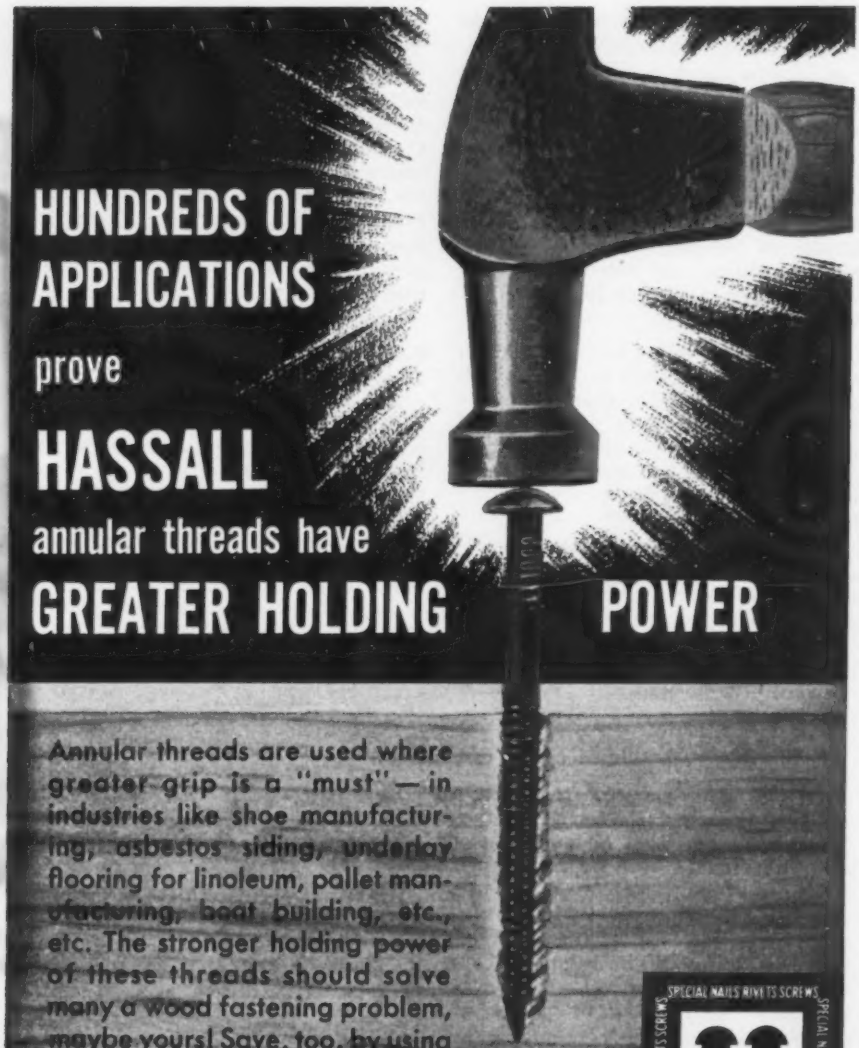

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RIP SAW BULLETIN

To announce its new line of heavy duty gang rip saws, the Mereen-Johnson Machine Co., Minneapolis 12, Minn., has produced an eight-page bulletin.

Well illustrated with details of construction, accessories and specification tables, the booklet describes uses of the saw in connection with furniture core stock and core banding strips, hardwood flooring, sheet materials and wire-bound boxes.

Ruggedness of the No. 441 machines can be demonstrated by the fact that they are being operated with 125 hp on the arbor, making 22 cuts in 8-quarter gum at 100 f.p.m. According to the manufacturer, the machines are so accurately made that they will even rip glue joints.

COST-ACCOUNTING MANUAL

The Hardwood Dimension Manufacturers Association, Heyburn Building, Louisville 2, Ky., is offering this book to the hardwood lumber manufacturer and others who may be interested. The book has been especially prepared for the hardwood conversion industry.

Its author, Vincent E. Noltemeyer, is known in the field of accounting. This practical book which he has written is slanted toward all branches of the hardwood lumber industry. Detailed instructions are given to (1) proper selection of species and grades of lumber; (2) utility charts based on competent studies of all kinds of hardwood lumber; (3) description of methods and procedures to properly account for true costs of materials; (4) illustrations of accounting for labor of conversion and final analysis for controlling costs, and (5) methods for determining factory overhead, and selling and administrative burden; and their application to cost finding.

ACME INSTRUCTION BOOK

The Max Manufacturing Co., 138 Stockton Ave., San Jose, Calif., has issued an instruction book on the use and care of Acme saw shop equipment. The particular machines discussed include: circular saw sharpener, planer knife and dado attachments, hand saw filers and saw vises.

The 28-page booklet was prepared under the direction of James McEwan, designer and builder of Acme products. All of the equipment is shown and concise instructions given for setting up the machines, checking and adjusting. Sections on filing and sharpening cutting tools are particularly good.

QUICK-CHANGE MOULDERS

The S. A. Woods Machine Co., Boston 27, Mass., has an attractive 16-page booklet on their quick-change moulders. These are Series 133 and 134. Each machine in the series is completely described and illustrated, including de-

You'll say "it's WONDERFUL!"

URAC 185

Expressions of complete satisfaction with the results from URAC 185 came to us from woodworkers, laminators and assemblers. High in their praise for this modern adhesive. You'll experience results of an exceptional nature when you put this glue to work for you. Order a trial can for use on your own job and be convinced.

WOOD TO WOOD

URAC 185 is the answer to your problem whether it be Bowling Pins or Bows, Bars or Boats, Tennis Racquets or Toys. It is ideal for gluing plastic laminates to Bar, Table, Soda Fountain or Sink tops.

PLASTIC TO PLASTIC

URAC 185 is **Stainproof, Rotproof, Water-Resistant** and **Non-Crazing. Low Pressure** properties make it especially adaptable for assembly work.

WOOD TO PLASTIC

Write for **FREE** bulletin or order direct: Branches at 109 Water St., New Haven 11, Conn.; 830 Kiser St., Dayton 1, Ohio; 1103 W. Marietta St., N. W., Atlanta, Ga.; 705 Cullen Blvd., Houston 3, Texas; 5928 So. Garfield Ave., Los Angeles 22, Calif.

Trade name registered by American Cyanamid Co., Mfr.

THE NELSON COMPANY
IRON MOUNTAIN, MICHIGAN

tails of frame construction. Black and white diagrams show such parts as the side head construction, side head spindle, feed mechanism, horizontal spindle construction and the feed-out end.

The electrical features are also shown and pushbutton control explained. Additional illustrations describe lubrication system, and motor drive. Specifications are given in tabular form and feed charts for both the motorized moulder and the belted machines.

MAPLE FLOORING GRADES

A new color folder, "Photographic Interpretations of Grades of Northern Hard Maple Flooring," has been published by the Maple Flooring Manufacturers Association. Single copies are available without charge from the Association, Suite 548, 35 E. Wacker Drive, Chicago 1, Illinois.

The folder illustrates direct photographic color reproductions of three maple flooring panels. In these reproductions, the engraver's color camera reflects, as faithfully as possible, the pattern characteristics expectable in First, Second and Third grades, the basic grades of maple flooring.

This new piece of educational literature will serve as a useful guide in interpreting the rules for MFMA grading, especially that part of the text which describes the natural tone variations allowable in each grade. A digest of the official grading regulations for maple flooring and the practical uses of each standard grade is included in the folder.

SUGGESTIONS WANTED

The last chance for suppliers and manufacturers to have their products featured in the permanent hardwoods exhibit opening early in 1953 at Chicago's Museum of Science and Industry has been announced by Burdett Green, of the Walnut Association and mem-

ber of the voluntary Hardwoods Exhibit Committee.

Lumbermen and wood fabricators are invited to suggest from one to ten items that they believe should be included in the exhibit because they utilize hardwoods in an interesting, beautiful or unique manner.

A wide variety of hardwood products will be featured in the final room of the exhibit, the large Hall of Hardwoods which is planned to show how hardwoods serve everyone every day.

The Hardwoods Exhibit Committee would like to display every creditable product made of hardwood. Since this is obviously impossible the committee urges everyone in the industry to help them do the best possible job of selecting representative hardwood products by submitting the lists of items he thinks should be displayed.

LOGGING BOOKLET

An attractive two-color booklet has been prepared as a general guide to show the equipment needed and procedures to follow when logging medium and small-sized logs under conditions most commonly encountered in logging operations

Entitled, "How to Log Small Timber Profitably," it is published by Hyster Company of Portland, Oregon, and Peoria, Illinois, manufacturers of a line of 33 tractor tools and attachments and earthmoving equipment.

The 16-page illustrated brochure includes methods of ground skidding, logging with arches and sulkies, cable yarding, log loading methods, power bundling methods, building log roads and other uses for the equipment. Also included are model views and specifications of Hyster tractor tools.

"The salesman's greatest asset," says a well-known sales manager, "is the ability to get in the frame of mind of liking everybody."

SHOPMASTER QUALITY TOOLS ARE TODAY'S BEST WOODWORK SHOP BUYS!
Simplified Tilting Controls
New Miter Gauge Stop Rod Included
Massive Cast Construction
Sealed for Life Ball Bearings
SHOPMASTER
8" TILTING ARBOR SAW
49.95
Shopmaster Tools are priced as low or lower than any other power tools on the market today . . . give you more outstanding precision features for a lifetime of accurate, dependable shop service. You'll appreciate their extra heavy, rugged construction, fine precision bearings, simplified operation, and exceptional versatility. Whether your shop is large or small . . . there's a Shopmaster Power Tool to fit every requirement. When you make up your equipment requisitions this year . . . be sure to keep low cost . . . high performance Shopmaster recognized quality tools in mind.
20" Tilting Table Jig Saw
Belt and Disc Sander
Spindleshaper
10" Swing Wood Turning Lathe
Saber Saw
12" Tilting Table Band Saw
12" Drill Press
10" Tilting Arbor Saw
FREE catalog of famous quality Shopmaster tools and accessories. . . . Write Shopmaster, Dept. WD-12, 1214 Third Street, South, Minneapolis, Minnesota.

ALL-ROUND UNIT FOR HIGH-SPEED PRECISION SHAPING

. . . Greenlee No. 180-B Motor Driven Shaper

Here's the *double-spindle* Shaper that you find speeding production in so many leading woodworking plants today.

Its size, spindle spacing, and design for extremely high spindle speeds, makes the GREENLEE ideal for high output of light or medium-heavy work. And its belted-motor-driven feature eliminates need for a separate frequency changer.

Since the success of any shaper depends mainly on its spindles, all GREENLEE Shapers have spindles that are designed for maximum strength and rigidity. Of alloy steel, scientifically heat-treated, they are capable of withstanding hard shocks and stresses and still maintain their original fine balance. Equipped with precision ball-bearings, they operate at high speed with maximum smoothness.

Rugged frame construction, proper table design, highest quality materials and fine craftsmanship throughout all combine with the other many features to make this an outstanding machine of excellent reputation.

For accurate, high-speed shaping and long-time, trouble-free service, investigate the GREENLEE No. 180-B Double-Spindle Shaper. Write today for complete specifications . . . ask for Bulletin No. 180-B. Greenlee Bros. & Co., 1872 Twentieth ..ve., Rockford, Illinois.

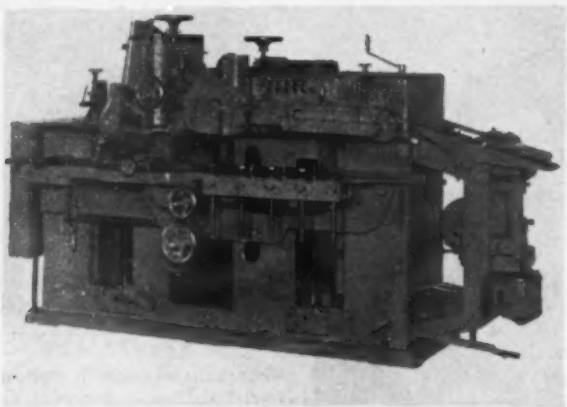
MACHINERY & TOOLS

GREENLEE

GREENLEE WOODWORKING MACHINERY: MORTISERS • BORERS • SAWS • TENONERS • PLANERS • SHAPERS • MORTISING and BORING TOOLS

EQUIPMENT and Supplies for the WOODWORKING INDUSTRY

CKL SASH AND DOOR STICKER



The newly designed "Challoner" No. 705, manufactured by the C.K.L. Machinery Co., Oshkosh, Wis., has two heads, top and bottom, powered by a 15 h.p. motor and driven by an endless flat rubberized fabric belt. The No. 705 will take stock from 9/16" bars to 18" wide bottom rails for doors. The width is set by power hoist, final fine adjustment being easily made by handcrank.

The stock is fed into the cutter heads by top power-driven feed rolls and a corrugated link chain running in the table. This combination provides the most positive feed available. The cutter head spindles have precision preloaded ball bearings and turn at 7500 r.p.m. The feed works is fitted with needle roller bearings. The feed rate is changed through a V-belt 3-step cone sheave, and standard rates are 50, 70, and 90 feet per minute. Special low rate for use with plow-bore being 23, 30, and 45 feet per minute.

A third cutter side head unit, arranged to machine the outside of the stock, as for checkrails, can be installed on the machine as optional equipment.

It is powered by a 5 h.p. motor, V-belted, with 7500 r.p.m. speed, and the entire unit has adjustment for tilting. A plow-bore attachment is available for running sash stiles. The stock is held by the operator on a table of the attachment while being plowed and bored, and then fed into the feed rolls for sticking.

C & D REFUSE BURNER

The C & D patented refuse burner is now being manufactured in Memphis by Wilco Machine Works, 1301 N. Hollywood St.

The C & D burner has several distinctive features and a method of construction that simplifies shipping and

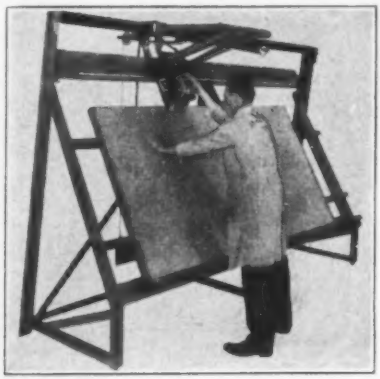
erection, according to D. N. Copp of Wilco Machine Works.

Two advantages of the C & D Burner are known as "syphon draft" and "circular draft." Syphon draft is created by an opening around the entire barrel about 6 to 10 feet down from the top. This draws cool air to the inside and upper part of the burner, causing a break-up of the updraft and forcing more complete combustion in the lower part of the burner, the manufacturer reports.

Circular draft is achieved by scientifically-placed baffle doors near the bottom of the barrel. These ports reportedly set up a whirling, cyclone-like air current that spins the burning particles around the burner and consumes them in this fiery tornado. Thus, complete combustion is claimed.

PANEL SAW

The new No. 48 Wallace panel saw is made with an inclined bed on which one man can easily place the panel. An adjustable overhead way supports the carriage—which is rolled from left to right along a scale to the desired length of cut-off. Quickly locked at



this point, the saw is then pulled downward to make the cut. J. D. Wallace & Co., 135 S. California Avenue, Chicago 12, Illinois, is the manufacturer.

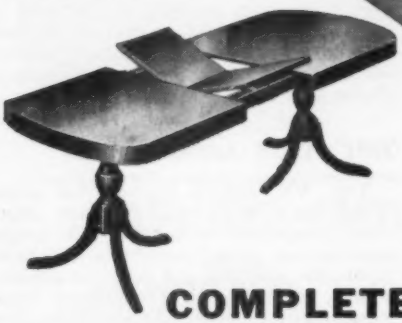
For ripping, the motor unit rotates 90° and is provided with an adjustable stop to locate the position. The saw can also be tilted for bevel rip, or bevel crosscut work. Machine may also be used for dadoing, plowing, and cut-off work on board stock. Crosscuts up to 48" wide, rips to 8' long.

SINGLE PAD AIR SANDER

National Air Sander, Inc., of Rockford, Illinois is introducing their new

Wabash
EQUALIZING TABLE SLIDES

Wabash Folding Leaf Equipment Pleases Buyers



WRITE FOR *Free* ENGINEERING CONSULTATION BLANK

COMPLETE TABLE SERVICE

WHATEVER your extension table problems may be . . . Wabash Slide Engineering Service can help you. If you want smoother operation, easier up-fitting, or unique features for your new patterns, consult Wabash. Have their construction styled by specialists at no extra cost. We manufacture slides with or without equalizers, complete folding leaf equipment, steel slides for porcelain top tables, and top locks.

Walter of Wabash

Starrett "Skip-Tooth" BAND SAW BLADES

- **Cut Faster and Cleaner**
- **Cut Any Material**
- **Outlast All Other Blades**

Because it holds its keen cutting edge until the teeth are completely worn out, one Starrett "Skip-Tooth" outlasts several ordinary blades. There's no resharpening expense, less blade changing. Cuts any wood, plastic, fibre or wood substitute better, faster, cleaner. Try one and you'll never go back to ordinary blades.

Regular Wood Band Saws Also Available
Write for Bulletin "WW"

Buy Through Your Distributor

Starrett

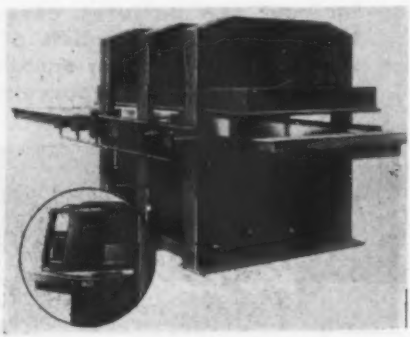
THE L. S. STARRETT COMPANY · ATHOL, MASS., U.S.A.

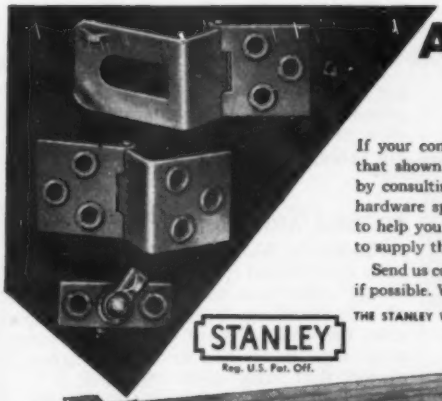
model 600, straight-line action, single pad air sander. This machine weighs only 5 lbs. and operates at 3200 r.p.m. It has a 5/16" pad stroke and 25 sq. in. of abrasive area.

The model 600 has a built-in water spray for wet sanding work, and is available with either rubber or felt backing pads. Improved paper holders allow simple and quick paper changes. Paper size required is 3-2/3"x9".

HOT PRESS ATTACHMENTS

The "VB" double opening hot press is available with hydraulic side pressure attachments while the "VB" single opening hot press is available with both hydraulic side and end pressure attachments, we are told. The use of these attachments helps eliminate sunken joints in the panels due to the unequalized moisture and pre-planing of the core prior to the veneering operation. The press is available from the





Ammunition Box Hardware

If your contracts call for hardware for ammunition boxes like that shown here, or for other ordnance equipment—save time by consulting Stanley. The largest manufacturer of hinges and hardware specialities, The Stanley Works has the "know-how" to help you develop the items you need, and the plant facilities to supply them on time.

Send us complete details of your requirements, including prints, if possible. We'll help you meet delivery commitments.

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THE STANLEY WORKS • NEW BRITAIN, CONNECTICUT

HARDWARE • TOOLS • ELECTRIC TOOLS • STEEL STRAPPING • STEEL

SLASH TOOL COSTS—SPEED PRODUCTION

With VELEPEC Carbide-Tipped Router Bits, Grooving Saws, Shaper Knives, Four Wing Shaper Cutters, etc. for every conceivable shape. Stay sharp 10 to 30 times longer than regular steel tools. They stay sharper, cut cleaner and faster with smoother finishes. Effect tremendous savings in machine "re-set" time and sanding operations.

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FRED M. VELEPEC CO.

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DON'T BE A SLAVE

TO OLD FASHIONED,
COSTLY
WOOD GLUING METHODS!

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Gluetool tank for 1 or more operators

For Applying Cold Glue
on Flat Surfaces
in Dowel Holes
in Grooves
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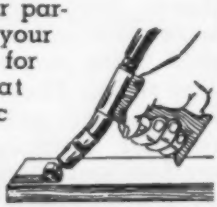
You'll like GLUETOOL because it's economical to buy —speeds production—cuts costs —glues better. Custom designed automatic spreader heads meet your particular needs. If your production calls for gluing—write at once for specific data by outlining your requirements.



Handy-grip, automatic flat surface spreader head

GLUETOOLS, Inc.

1930 N. Meridian St.
Indianapolis 2, Ind.

V. Berthelsen Engineering Works, P.O. Box 1423, Lockport Rd., Joliet, Ill.

The photo illustrates the single opening "VB" press with the automatic side pressure attachments installed and a view of the "VB" semi-automatic loading table.

TILTING ARBOR SAW

Heston & Anderson, Fairfield, Iowa, have announced the addition of a new 8" tilting arbor saw to the company's line of woodworking equipment. The new saw, known as Model 852, is of heavy grey iron construction and features a motor that tilts with the saw.

Other features stressed by the company include life sealed ball bearings for protection against dirt and dust, miter gauge slots on both sides of saw, a modern steel floor stand and easily accessible controls, sawdust chute, large 26"x20" cast iron table top, extra long aluminum rip fence with accurate gauge, and splitter with safety guard attached. The saw measures 12" from the blade to the front of the table.

QUICK-SETTING ADHESIVE

The Industrial Division of American Consolidated Dental Products Co., Philadelphia, Pa., announces the development of F-88, a quick-setting thermoplastic cement for use in many woodworking applications.

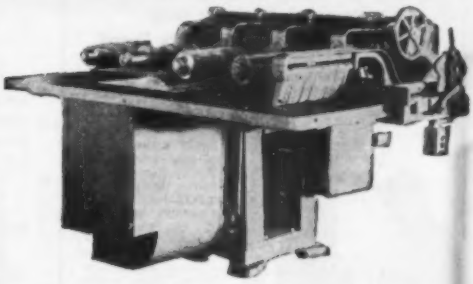
Characteristics of F-88 (it will set in a minimum of five minutes) make it adaptable for a wide variety of wood joining jobs. It may further be used as a filler and sealer. F-88 is a two component system consisting of a powder and a curing agent which is a clear, colorless liquid. It is also available in a wide range of colors for matching purposes.

DIEHL RIP SAW

A completely new multi-blade rip saw, with arbor mounting, table and frame of integral construction, is announced by the G. M. Diehl Machine

A Real Husky

No. 213 A MODERNIZED HOOSIER SELF FEED RIP SAW



SAW DUST DRUM IS OPTIONAL

DESIGNED FOR THE TOUGHEST RIPPING JOBS

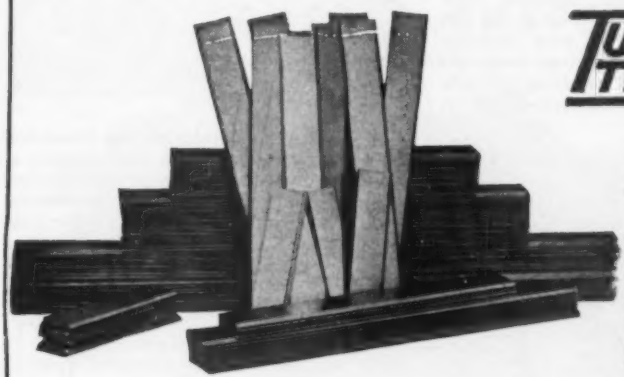
FOR QUICK OPERATION — DEPENDABLE PERFORMANCE

This sturdy unit is designed specifically for high speed ripping of stock longer than 24" and as a gang ripper for stock as short as 12". The No. 213 is equipped with a stationary table top having all feed works brackets bolted to the top—as is the gear reduction drive. The mandrel rides on ball bearings and is raised and lowered quickly by a hydraulic cylinder. Eight driven rolls feed the stock through the saw at high speed. A 50 H.P. motor drives this unit at full capacity. The No. 213 is a real workhorse, built to handle your toughest jobs. Available for direct motor or V belt drive.

SINKER-DAVIS CO.

230-250 SOUTH MISSOURI ST. DEPT. O

INDIANAPOLIS, INDIANA



TUNGSTEN TEMPER

HIGH SPEED THIN KNIVES

Stalter High Quality of workmanship and material is always reflected in increased production with less "down-time."

PROMPT DELIVERY

High speed thin knives are just one of the many Stalter products for the woodworking plant. For complete details,

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STALTER EDGE TOOL COMPANY

GRAND RAPIDS MICHIGAN

Fastest Cut-off Saw on the Market!*
Made by Heston and Anderson
The answer to top-speed production for your plant or work shop.

Cuts Wood, Metal or Plastic!

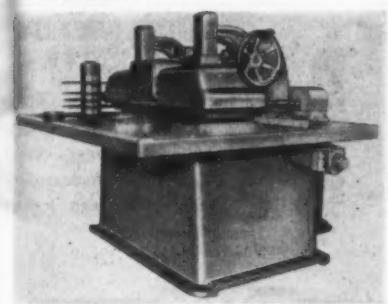
An exclusive new automatic air unit makes possible the super speed of the Heston & Anderson Swing Saw. May be used with wood, metal or plastic. Compact and sturdy, its superb construction insures accuracy with every cutting. Easy to operate! Here is truly the finest equipment for your plant or workshop.

Write Today!

Write for FREE literature . . . name of nearest authorized dealer.
*Thirty-three wood cuttings per minute during routine plant tests.

HESTON & ANDERSON
Division of St. Paul Foundry and Mfg. Co.
11-1A FAIRFIELD, IOWA

Works, Inc. of Wabash, Indiana. The new model, called the Diehl No. 99 multi-rip saw, achieves new degrees of precision in gang ripping, long-life accuracy, time-saving on setup and adjustment and greatly increased safety, we are told.



By eliminating arbor and table adjusting mechanisms and by introducing a new throat plate cutting attachment, savings in setup and adjustment time are accomplished. The rugged construction of the No. 99 minimizes vibration. The saw arbor, mounted in precision ball bearings, is set rigidly in the frame. Through centralized adjustment, the pressure bar is easily raised to accommodate different stock thicknesses.

The new No. 99 has eight powered feed rolls, four below and four above, assuring greater accuracy of feed. Saw blades from 10" to 14" in diameter may be used.

STARRETT HOOK RULES

The L. S. Starrett Company, Athol, Mass., offers a complete line of hook rules to meet the demands of the woodworking industry. The trend toward mass production methods, especially the greater emphasis on factory assembly and prefitting of many items formerly constructed or cut to size in the field, has caused a general tightening up of measuring tolerances.

A hook rule combines the precision of a steel rule with the convenience of the hook feature which permits taking rapid measurements of any dimension with assurance that the end of the rule is precisely aligned with the work.

Starrett Hook Rules are available in lengths from 4 to 72 inches in standard or narrow widths. No. 419 (illustrated) is available graduated on one side in 8ths and 16ths, and in quick-reading 32nds and 64ths on the other.

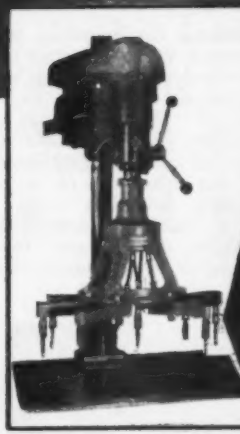
DELTA-CRESCENT BAND SAW FEATURES CARTER GUIDES

Carter micro-precision band saw guides are now standard equipment on the Delta-Crescent band saw manufactured by the Crescent Machine Di-

FASTER HOLE PRODUCTION

WITH

Commander MULTI-DRILLS



- Drills up to 8 Holes at 1 Stroke
- Fits Any Drill Press
- Adjustable to Any Hole Pattern
- Quickly Pays for Itself Many Times Over

● Commander MULTI-DRILLS are instantly and easily adjusted to handle any hole pattern within a 9" circle. Standard Extension Spindles will increase working area to 22½". Minimum center distances close as ½". Compact in design, ruggedly built, Commander MULTI-DRILLS are making BIG Savings in time and labor for woodworking plants everywhere. Special adaptations available.

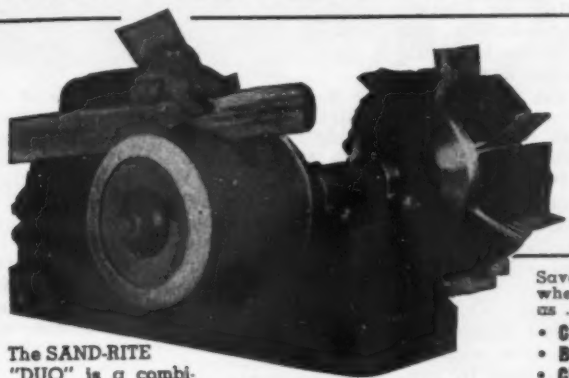
Write FOR CATALOG #851 which describes Commander's Production Tools

Your nearby Commander Distributor has the MULTI-DRILL. Write for his name.

Commander MFG. CO.

4222 W. KINZIE STREET • CHICAGO 24, ILLINOIS

SAND CONTOUR SHAPES FASTER



USE A

SAND-RITE "DUO" SANDER

The SAND-RITE "DUO" is a combination Rotary Brush and Pneumatic Drum Sander that is highly versatile for use in every shop.

Save time and materials when you sand such items as . . .

- CHAIR LEGS & ARMS
- BRUSH HANDLES
- CHAIR SEATS
- GUN STOCKS
- FURNITURE TRIM
- MOULDINGS

WRITE TODAY FOR CIRCULAR

SAND-RITE MFG. CO.

Dept. W., 226 W. Schiller St.
Chicago 10, Illinois

Reduce Costs by assembling your products easier and stronger with "Rockford" Quality Controlled Threaded Fasteners.
We manufacture a complete line.
Cap and Set Screws
Socket Head Cap and Socket Set Screws
Studs
• Machine Screws and Stove Bolts
Nuts — Square & Hexagon
• Wood Screws and Drive Screws
• Sheet Metal Screws
Carriage Bolts
Specials
Aircraft Screws & Bolts
• Made in Slotted or "Rockford-Phillips" Heads
"Quality Controlled Products"
"ROCKFORD" Screw Products Co.
2501 S. Ninth Street
ROCKFORD, ILLINOIS
Phone: 4-9441 or Teletype: RK 88

vision, Rockwell Manufacturing Company.

Scientifically designed for precise, high-speed band saw production, the compact Carter guide holds the band saw blade rigidly and close to the work enabling the blade to cut better at all speeds.

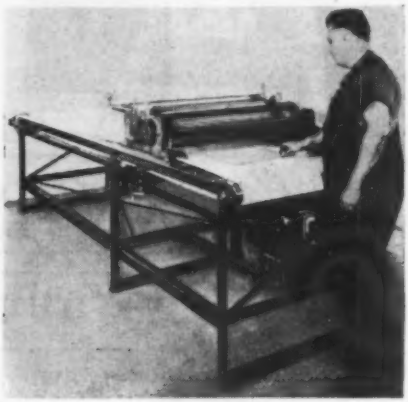
Micrometer adjustment to assure maximum support of twist and thrust loads may be made safely while the machine is in operation. The guide wheel is completely guarded, protecting the hands of the operator from the speeding blade.

Guide wheels and jaw blocks are deliberately designed to take wear instead of the costly saw blade by preventing heat which crystallizes and galls the blade causing breakage and down-time.

Carter micro-precision guides are available in three sizes for use on 12" to 42" band saw machines.

POTDEVIN WOOD PAINTING MACHINE

A new machine for painting wood or other materials up to 2 inches thick and 30 inches wide is now being marketed by Potdevin Machine Co., of Teterboro, N. J. Paint coatings are uniform over the entire painted area and thickness of coating can quickly be adjusted from either side of the machine. Handling materials from ⅛" thick up to 2" thick is accomplished by simply setting an indicator to the required setting to coat material of any thickness.



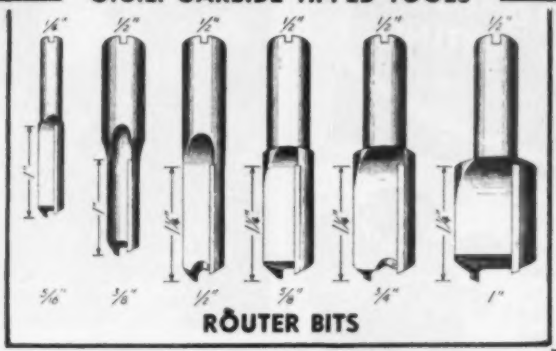
A Reeves variable pulley drive permits the speed of the wood painting machine to be altered to suit the various types of materials being coated. The feed tank is removable to facilitate cleaning. Conveyor supplied has 12 feet of working surface that can be equipped with a clutch to disengage the conveyor so that the machine can continue to run thus preventing the paint from drying on the rollers. Potdevin wood painters can be supplied in other sizes.

MASSIVE KNIFE GRINDER FOR ATOMIC PROGRAM

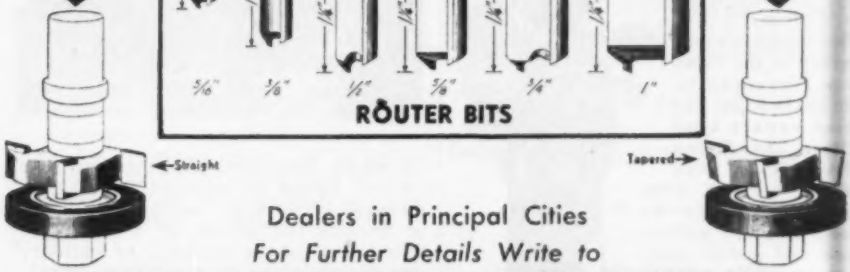
Samuel C. Rogers & Company of Buffalo, N. Y., has announced the completion of a massive, 12 ton grinder of the 220 series with a new, hydraulic fluid motor drive. The actual purpose

O.C.E. CARBIDE TIPPED TOOLS

PLASTIC TRIMMERS



PLASTIC TRIMMERS



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PRICE & RUTZEBECK DISTRIBUTING CO.

P. O. BOX 30 — HAYWARD, CALIFORNIA

WHIZ-SAW

NEW! More Powerful!

RIPS AND CROSS-CUTS 2 INCH PLANKS

MODEL No. 2

WHIZ-SAW #2, one of the most versatile cutting tools ever invented, cuts with amazing speed . . . wood, bone, plastic, fibre, asbestos board, pressed wood, hard rubber, etc., up to 2 inch thicknesses. Ideal for all craftsmen. The original WHIZ-SAW #1 cuts up to 1 inch thickness. ($55.00) WHIRL-SAW, 4½ inch circular blade, cuts up to 1¾ inch thickness. ($49.00)

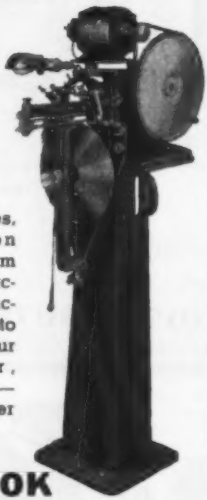
$130.00

If not available at your dealer, write to:

THE Forsberg MFG. CO., BRIDGEPORT 1, CONN.

Makers of the Famous Whale & Viking Tools

How to get
25% to 40%
FASTER CUTTING
with your Power Saws



The machine accuracy of the Foley Saw Filer cannot be equalled by the most expert hand filing. The Foley automatically joints the saw as it files, bringing all uneven teeth back to uniform size and perfect spacing. Instantly production goes up 25% to 40% because your saws cut faster, smoother, run cooler—and stay sharp longer too!

FREE BOOK
on Modern Saw Maintenance

This is the instruction book which goes with every Foley Saw Filer. It will show you how the Foley eliminates all inaccuracies, how simple and positive its adjustments are. If you are conditioning saws by hand, this book points the way to both increased production and reduced saw maintenance costs.

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FOLEY MFG. CO.
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Without obligation, send me the Foley Saw Filer Instruction Book.

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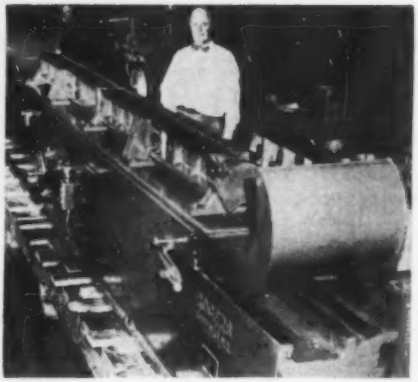


to which this particular grinder is to be put cannot be released at this time because of security reasons. However, it heralds the arrival of a new type grinder which is available to industry for maintenance or production grinding.

Grinders of this type are particularly adaptable for fast grinding of shear blades, paper, veneer, chipper and other heavy duty knives. It also can be used for flat face, bevel and edge grinding. This new Rogers model weighs 12 tons and its work table measures 184". A magnetic chuck speeds up work loading and unloading time. Even though the work table weighs as much as 4 tons, the new fluid drive moves the work past the grinding head at speeds up to 100 f.p.m.

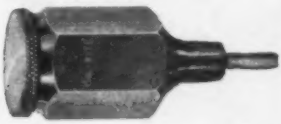
SCREW GAUGE

To enable the trade and user to identify the size of wood screws, Southern Screw Co., Statesville, N. C., is now distributing without charge an attractive wood screw gauge.

This gauge is used to measure the screw when one wishes to determine the exact length and diameter. Southern Screw Co. will send one of these gauges without charge to wholesalers and manufacturers who use wood screws, when the request is written on the company letterhead.

WICK FEED OILERS

Here are wicks which can be inserted into and around the standpipe of a machine. They feed filtered oil, and therefore, dirt cannot reach or injure bearings. Oilers are especially suitable for use in dusty surroundings on all classes of machinery.



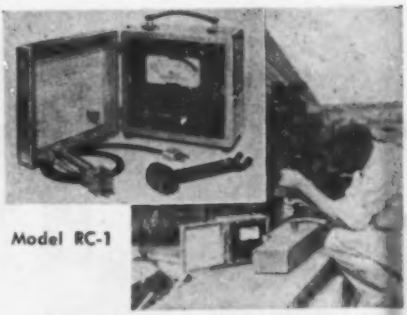
Oil in the body of the cup is carried through the wick over the standpipe to the bearing by capillary action, assisted by a syphon effect. Oil of light or medium body should be used as the oil must remain fluid enough at the temperature used to feed by capillary action.

One-piece hexagonal brass bodies and knurled brass screw tops are machined from solid bar stock. The oilers, manufactured by the Oil-Rite Corp., Manitowoc, Wis., have wicks which can be easily replaced.

PLANER-MATCHER

As an important addition to their line of high production woodworking machinery, Ekstrom, Carlson & Co., 1400 Railroad Avenue, Rockford, Illinois, has just announced the No. 615 planer-matcher. Heavy-duty in every sense of the word, this new machine is built to accommodate up to 75 hp motors for driving the top head; 50 hp motors for the bottom head; 40 hp drive motors for the left side head; 25 hp motors for both the right side head and the bottom profile head; while the top profile head can be equipped with up to 30 hp motors.

A 30 hp drive motor is employed to provide the feed works with an infinitely variable rate of feed ranging from 75 to 450 f.p.m. For those users requiring a higher rate of feed, No. 615A planer-matcher is available providing a rate of feed ranging from 100 to 600 f.p.m.



Model RC-1

"SAVES HOURS" with Delmhorst Moisture Detector . . .

. . . Says Mr. Herbert Seidel,

Reisen Hardwood Lumber Co., Union, N. J.

". . . We use it constantly to check the moisture content of incoming lumber, to select air dry stock from the yard stocks and to check out-going lumber," writes Mr. Seidel.

"In the kiln operation, the Moisture Detector has proved to be a necessity (especially when used with the 26E electrode) for making quick checks on lumber entering the kilns . . . SAVES THE KILN OPERATOR HOURS in starting a new charge in the kiln.

"We know that it has paid for itself time and again in every operation of our business that requires knowledge of lumber moisture content."

Moisture Detector Advantages

Note the advantages of the Delmhorst Moisture Detector:

- **Quickly and accurately measures moisture content of any wood product from 6-65%**
- **Direct reading in percentages on large 4½ inch dial. No calculations required.**
- **Interchangeable electrodes for multi-purpose use.**
- **Ideal for dry kiln testing — wet cores can be tested without cutting lumber.**

Send for complete information. Fill in the coupon and mail it today.

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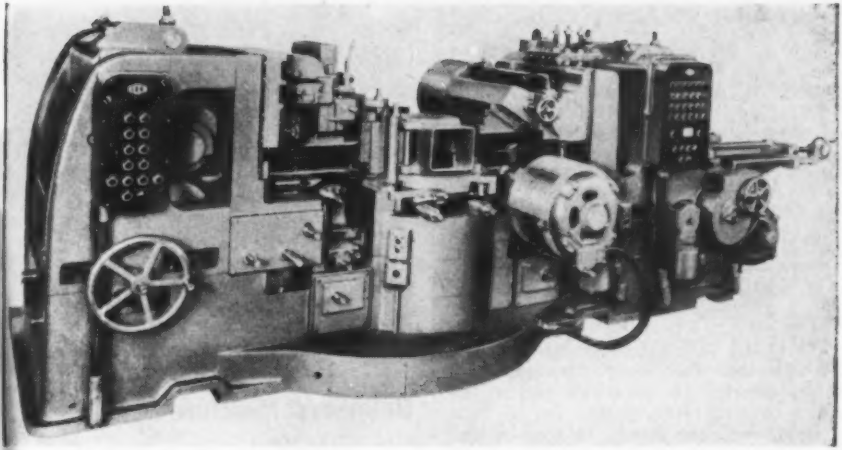


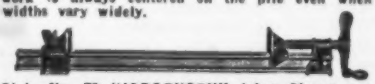
This planer-matcher will accommodate rough stock 6"x15" (finishing to 5½"x14½"). All cutter heads have a 10" cutting circle and can be furnished with either 10 or 12 knives. Stock 2½" wide can be run through the standard machine; however, narrower widths, down to 1½" wide can be handled by using fillers and cutter heads with different cutting circles.

The machine can be furnished to operate on either 550, 440, or 220 volts,

"Jorgensen" PILING CLAMPS

TRADE MARK Reg. U.S. PAT. OFF.

Style No. 2100 "JORGENSEN," for the most economical and convenient method to increase your edge-gluing capacity. More glued stock per pile—work clamped on both sides prevents buckling—all clamping done on same side of pile—any thickness of stock, any length, width, or height of pile without special fixtures or trucks. The work is always centered on the pile even when widths vary widely.



Style No. 76 "JORGENSEN" I-bar Clamps are a long-time favorite: the Multiple Disc Clutch zips to position, holds securely, releases easily without notches or other deformity in the bar. Carefully designed and manufactured for longest service—at no extra cost to you.

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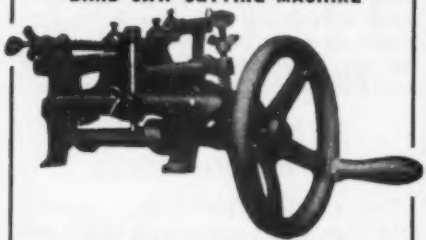
FESTO WOODWORKING MACHINES

745 - 51st St. Brooklyn 20, N. Y.

SIMPLEX
BAND SAW SETTING MACHINE



Simple yet accurate and efficient. Will do more and better work than any other machine of its kind.
The vise takes saw blades ⅛"—1½" in width and by automatically gripping the saw while tooth is being set, prevents twisting of narrow saw blades. The feed finger is adjustable to teeth with ⅛"—⅝" spacing, point to point.
All adjustments for different widths, teeth, etc. are regulated by but two thumbs screws.
Best working speed 100 revolutions (200 teeth) per minute, each revolution setting two teeth. A saw can be set in 4 to 5 minutes.
The machine can be fitted with a flat or V pulley for power operation if desired.

Further Details Upon Request

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SIMONDS
New SI-CLONE SAWS

SCIENTIFICALLY HEAT TREATED • ACCURATELY GROUND
CUTS STRAIGHT • FAST • SMOOTH — STAYS SHARP

This complete new line of circular saws UP TO 12" in diameter, will give long, satisfactory service, excellent performance and the most value for the least cost. For use on all makes of table, bench, swing, radial arm and portable electric hand saw machines.

TYPE OF SAW	SIZE	PRICE
Cut-off	6"	$1.75
Rip	7"	2.00
Combination	8"	2.15
52, 54, 60	10"	3.15
Easy Cut	12"	4.35

TYPE OF SAW	SIZE	PRICE
Hollow	6"	$2.75
Ground	8"	3.95
Planer	10"	7.45
	12"	9.95

ALL SAWS SHIPPED POSTPAID EXCEPT C.O.D. ORDERS. SPECIFY BORE WHEN ORDERING, OR IF PORTABLE ELECTRIC SPECIFY MAKE AND MODEL. SEND FOR LITERATURE.

Each saw is individually packaged, in factory-perfect condition, ready for use.

STOCK UP NOW • ORDER TODAY • WRITE FOR FREE CATALOG

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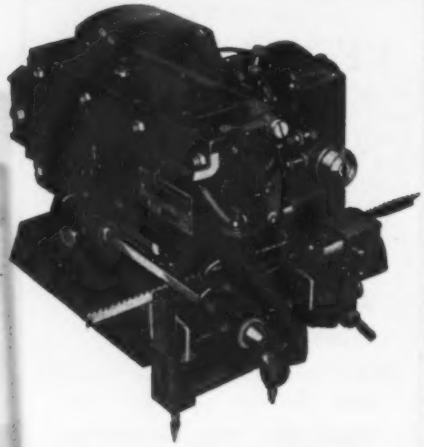


FILES, SETS, JOINTS Without Removing Saw From Sharpener

This improved saw sharpening machine has features that are found nowhere else. When the band saw is clamped into position, every operation is completed without removing saw from clamp. It files, sets and joints doing the work of 4 men sharpening by hand.

A big reduction in saw purchases is noted after the K5 goes to work. Saw breakage and saw cracks are stopped. The saws cut fast, smooth and straight and last longer.

THE WARDWELL MFG. CO.
3161 Fulton Road Cleveland 9, Ohio

WARDWELL

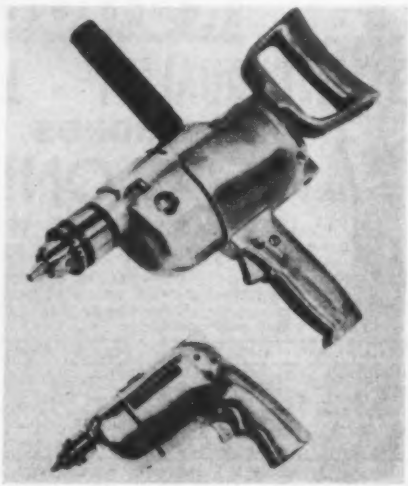
3 phase, 60 cycle; while all pushbuttons (pushbutton stations conveniently located at both the infeed and the outfeed ends of the planer-matcher) operate on 110 volts. All motors have overload and low voltage protection.

ELECTRIC HAND DRILLS

Two electric hand drills, a general duty type with quarter-inch chuck and a half-inch capacity special duty mold, are now being introduced by the Porter-Cable Machine Company of Syracuse, N. Y.

Both models have spindle ball-bearing construction to absorb radial load and end thrust, Jacobs gear-type chucks for slip-proof gripping of bits, and Universal motors. Housings are satin finished die-cast aluminum with air-cool vents located to avoid covering by hand.

The Porter-Cable "General Duty" Model 107 with ¼" chuck is designed



for all-round intermittent use. It has a full-hand pistol grip with push-button lock. Compound reduction gears

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VENEER COMPANY

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HALF-ROUND

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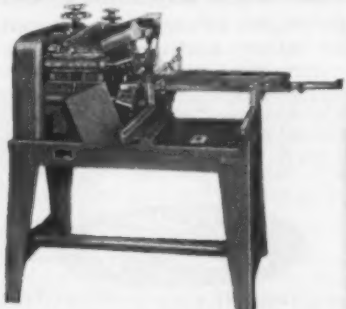
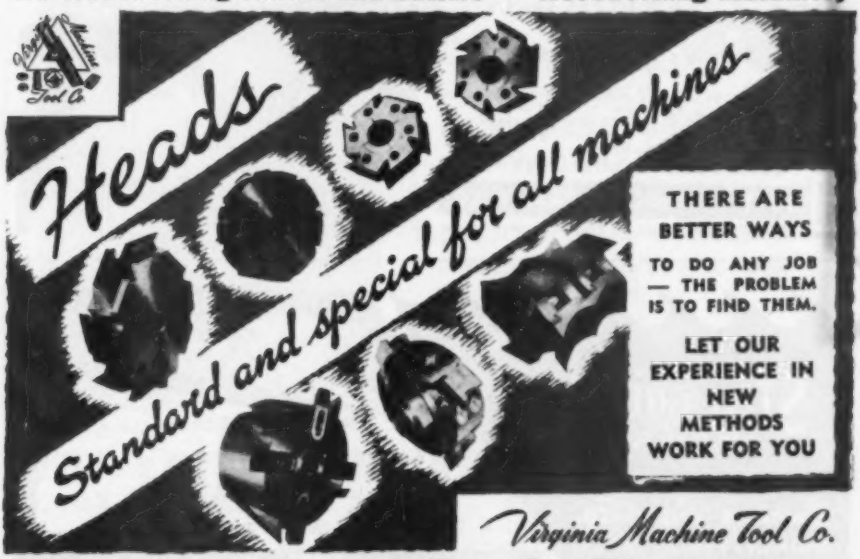
DELUXE FLOOR MODEL TENONER



New adjustment allows exact and simultaneous adjustment of tenon spindles.
3 H.P. Motor.
3 Inch Blades
V Belt pulley drive on both tenon and cope spindles.
Heavier Construction for greater accuracy.

MILLBURY MACHINE COMPANY
13 WATERS STREET MILLBURY, MASS.

HS Woodworking Knives and Cutters • Woodworking Machinery


Heads
Standard and special for all machines
THERE ARE BETTER WAYS
TO DO ANY JOB — THE PROBLEM IS TO FIND THEM.
LET OUR EXPERIENCE IN NEW METHODS WORK FOR YOU
Virginia Machine Tool Co.
BASSETT, VIRGINIA

TUNGSTEN HIGH SPEED STEEL ROUTER BITS

deliver maximum power to the spindle for more efficient drilling. This compact tool is 8¼" long and 2¾" wide. It can drill within ¾" of a parallel surface, and weighs only 3 lbs., 6 ounces.

The Porter-Cable "Special Duty" Model 109 with half-inch chuck is built for intermittent production use where plenty of power is needed. A spade handle can be changed to vertical or horizontal position, or removed entirely. The lower full-hand grip has a trigger lock-bottom switch. A removable auxiliary handle which can be mounted on top or side of drill enables the operator to increase pressure and control torque. Tool without rear handle is 10¾" long, 3¾" wide. It drills within 1¼" of a parallel surface and weighs 9 lbs. This model has double compound reduction gears and idles at 450 r.p.m.

CORNER CLAMP

Here is a sturdy shop tool made of .062 gauge welded steel. Size is 7"x7" on the corner. The clamp takes stock up to 2½" and is operated by a thumb screw. A threaded clamp foot has special gripping features that help the clamp "hold without crushing."

The clamp can be used for picture frames, mouldings, screen framing, etc.,

Nutting

Most Complete Line of Floor Trucks in America

Figure 321—Lumber Buggy. Large wide tread wheels for outdoor as well as indoor use.

Figure 1011—Balance style for turning sharp corners. Variety of superstructures and wheel sizes.

Figure 1191—Timber Dolly. Used as a dolly or, inverted as a portable roller.

Figure 1419 and 421—

Jacks and Skids. Stores and transports materials with one-time handling. One Jack services many Skids.

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Deliveries to Meet Your Requirements

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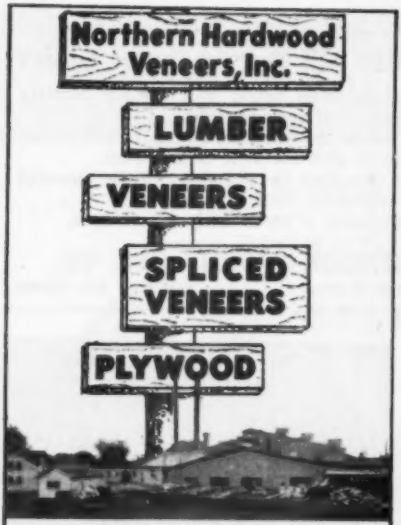

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Northern Hardwood Veneers, Inc.
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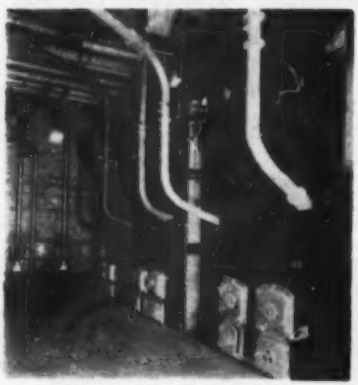

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IMPROVED Ball Bearing Shaper Collars

Friction between collar and pattern entirely eliminated — no more burning.

Outer rim is independent of the slotted collar and revolves with the feed of the work.

Collars can also be supplied without grooves for use with solid steel cutters.

Give diameter of collar and size of hole.

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1637 Lowell Avenue Chicago 39, Illinois

we are told by the manufacturer—Belruss Manufacturing, Inc., 4 Rogers Place, Manchester, Conn. When in use, it grips two sides of the frame or corner firmly in postion for nailing or securing with patent fasteners. The corner clamp can also be used as a glue clamp for setting mortise and tenon joints.

MARKET DATES—1953

Chicago Winter Market	Jan. 5-16
Grand Rapids Winter Market	Jan. 5-16
New York Winter Market	Jan. 19-24
High Point Winter Market	Jan. 19-31
Los Angeles Winter Market	Jan. 26-30
San Francisco Market	Feb. 2-6

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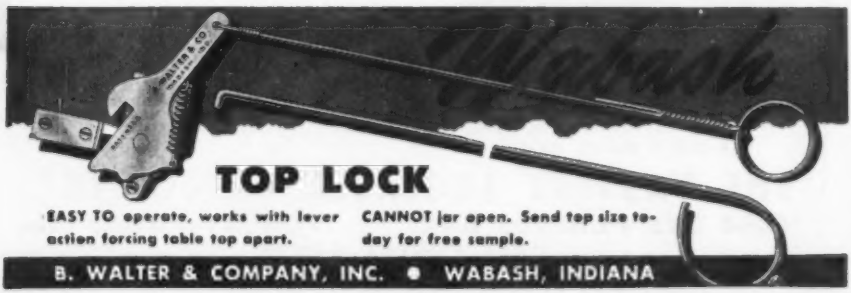

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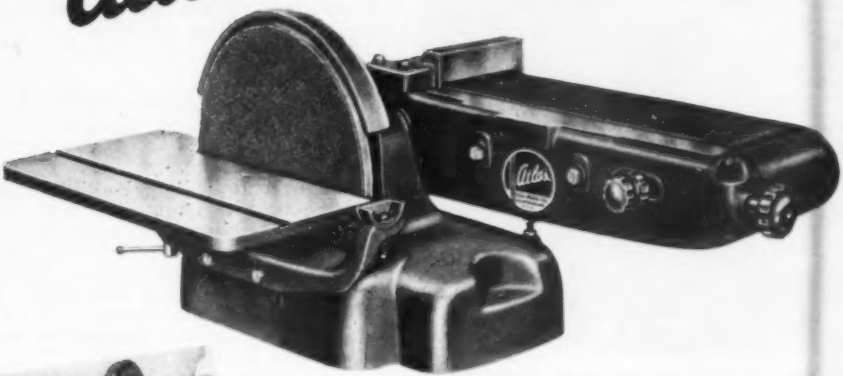
Speeds Sanding of Regular and Irregular Shapes, Curves, Angles

Atlas BELT and DISC SANDER



For production or fine pattern work you can't beat the versatility of this Atlas sander. The disc is 10". The belt is 4" and operates in both horizontal and vertical positions. The tilting table can be used with either belt or disc. Table is precision-ground for smooth work feeding, and grooved for a mitre gauge to simplify duplicate work. Ball bearings and traditional Atlas-tool ruggedness assure lasting accuracy. See this sander at your Atlas dealer's — ask him to show you every feature. Send for the latest catalog.

ATLAS PRESS COMPANY

1227 N. PITCHER ST. • KALAMAZOO, MICH.

Atlas

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DIEHL HOLDS SALES MEET

Corral 55 men who sell the machines used by the precision woodworking industry on three continents—hold them together for three days—and you have a cross-fire of pin-pointed questions and answers that spell new advances in machines, new gains in plant production.

Such was the situation at the international sales meeting held recently at Wabash, Indiana by the G. M. Diehl Machine Works, Inc., manufacturers of precision woodworking machinery. Men were there representing Diehl throughout the U. S., in Canada and in western Europe.

Fred A. Collings, chairman of the board, addresses the 1952 meeting. More than 50 representatives attended.

The Diehl-Vonnegut moulder is demonstrated at the sales meeting held in the company's plant.

One outstanding point stood out above all others at the Wabash gathering—every man present knew his customers' problems as well as the machinery they use. Such a fact speaks well of the woodworking industry as a whole; that it is unusually progressive and open-minded in attitude, and is well aware of the importance of exchanging information throughout the field.

Two new machines were unveiled at the Diehl sales meeting—the new Diehl No. 99 multi-rip saw and the new Diehl "Hydronic" nailing machine.

HIGH GRADE VENEER PANELS FROM LOW GRADE LOGS

Second growth timber is now being cut in ever increasing quantity. This timber contains many branches that reveal themselves as knots in the veneer. If the knots are defective, they generally fall out causing open defects. Splits in the log ends also result in open defects in the veneer. All such defects are a serious liability in conventionally made plywood.

Elmendorf Research, Inc., of Chicago, have now completed their research work aimed toward using second growth timber in high grade veneer panels. This organization proposes to license a limited number of manufacturers having veneer machinery and a hot plate press.

The new Elmendorf products use veneer only for the panel surfaces. The panel centers are made of wood waste and all of the veneers are obtained from relatively low grade logs and are usable for faces and backs. As all open defects are simultaneously patched, veneer waste has been almost completely eliminated. Two types of cores have been developed. Figured, clear sliced veneers as well as plain rotary cut veneers containing any number of knot holes can be used. The panels can be made in any thickness from 1/8" to 1". They are very flat and take the finest finishes.

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WOOD WORKING DIGEST

DECEMBER, 1952

READER'S SERVICE DIVISION

This insert (please note all four cards) is designed to help you obtain woodworking information. Any of these cards mailed to our Service Division will receive careful attention. There is also a form within the book for shop problems, used machinery, etc. Let us know when we may be of service to you. No obligation.

Please send information on PRODUCTS and SUPPLIES described on the following pages:

....

....

Name..... Position.....

Company .....

Street .....

City..... Zone..... State.....

PRODUCT INFORMATION

A quick, free way to obtain information about the equipment and supplies you need to buy.

- Abrasives
- Adhesives, animal
- Adhesives, casein
- Adhesives, phenolic
- Adhesives, resin
- Adhesives, resorcinol
- Adhesives, urea
- Air Compressors
- Band Saw Tires
- Bits, auger
- Bits, dowel
- Bits, router
- Bleaches
- Belts
- Boring Machines
- Car Pullers
- Chisels
- Clamp Carriers
- Clamps
- Conveyors
- Cutters
- Dimension Stock
- Dowels
- Drill Attachments
- Drill Presses
- Drills
- Dry Kilns
- Dryers
- Dust Collecting Equipment
- Electric Eyes
- Fasteners
- Files
- Fillers
- Finishes
- Glue Equipment
- Glues, electronic
- Grinders, knife
- Grooves
- Guards
- High Frequency Heating Equipment
- Hose
- Jointers
- Knives, moulder
- Knives, planer
- Knives, shaper
- Knives, veneer
- Lathes
- Loader Hoists
- Lumber
- Machines, banding
- Machines, box & crate
- Machines, carving
- Machines, clamping
- Machines, door and sash
- Machines, dovetailing
- Machines, dowel
- Machines, filing & sharpening
- Machines, grading
- Machines, mortising
- Machines, mulling
- Machines, sawmill
- Machines, saw setting
- Machines, screw driving
- Machines, stapling
- Matchers
- Moisture Meters
- Mortise chains
- Moulders
- Nails
- Packaging Material
- Paint
- Planers
- Planes
- Plywood
- Presses, plywood
- Putty
- Resaws, band
- Rippers
- Routers
- Safety Clothing
- Sanders, automatic stroke
- Sanders, belt
- Sanders, contour
- Sanders, disc
- Sanders, drum
- Sanders, endless bed
- Sanders, portable electric
- Sanders, special
- Sanders, variety
- Sandpaper
- Saws, arbor
- Saws, band
- Saws, chain
- Saws, cross-cut
- Saws, cut-off
- Saws, gang
- Saws, portable electric
- Saws, radial
- Saws, rip
- Saw blades, band
- Saw blades, carbide
- Saw blades, circular
- Saw Guides
- Screws
- Shapers
- Shaper Collars
- Spray Equipment
- Stackers, lumber
- Surfacers
- Tackers
- Tenoners
- Transfer Cars
- Trucks, dry kiln
- Trucks, factory
- Unstackers, lumber
- Veneer
- Veneer Clippers
- Veneer Dryers
- Vises
- Washers
- Wheels
- Wood Treating Compounds

Data will come direct to you from responsible manufacturers. Your request involves no obligation.

Name..... Position.....

Company .....

Street .....

City..... Zone..... State.....

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Name..... Position.....

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City..... Zone..... State.....

Products .....

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Without obligation please send more information and literature on the items shown on the pages indicated from the _____ issue of WOOD WORKING DIGEST.

Product	Page No.

Company _____ Title _____

By _____

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LATHE CHARGER

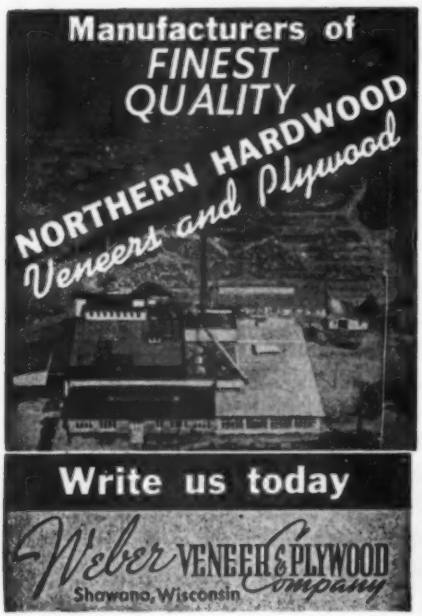
An outstanding development in plywood equipment this year is an overhead lathe charger, engineered and built by Ederer Engineering Company, 2931 First Ave., S., Seattle. It is designed for rapid peeler block handling; lifting peelers of any size and shape; pre-centering them for the lathe and holding them at "ready" until lathe is clear for the next peeler. Charger then moves peeler to exact center; peeler is immediately chucked and charger returns for the next pick-up.

One man can handle the entire job of spotting for the main lathe in approximately a 60-second cycle, depending on runway length—just a fraction of the time usually required for this operation. The charger is an adaptation of a suspension-type overhead twin-rail crane, hydraulically powered, and operated from one set of hydraulic controls located wherever is convenient for the operator.

After the jaws of the charger clamp the peeler firmly, the suspension cylinders lift the peeler by vertical and side to side motion to align for the lathe chucks. Two projectors with gun-sight cross-lines are positioned, one on each side of the charger. The cross lines are in exact center with the lathe spindles. A mirror on the side away from the operator enables him to watch the alignment on the far end of the block.

When the block is centered, the carriage is ready to move forward. As a core block is dropped from the lathe, charger moves the new peeler into position, stopping automatically at exact loading position. Chucking is then but a matter of seconds.

Peeler blocks are lined up behind the charger and moved forward to a centering cradle at a pre-set distance from the lathe. Length of block storage and distance of run between centering cradle and lathe may be laid out according to space requirements of the plant. The charger will handle any size peeler.



Mechanics Through The Ages

BEFORE HE CONCENTRATED ON THE STEAM ENGINE, JAMES WATT OF SCOTLAND WAS A MATHEMATICAL INSTRUMENT MAKER—— WHICH MEANS: HE MENDED CLOCKS; SHARPENED CUTLERY; FIXED MUSICAL INSTRUMENTS —AND SURVEYED LAND—!
Rod Ruth
THE WORKING BEAMS USED ON THE PIONEER STEAM ENGINES BUILT BY NEWCOMEN OF ENGLAND IN THE MID-1700'S OFTEN WERE SIMPLY LARGE TREES, VIRTUALLY UNHEWN.
THE BOILER OF PETER COOPER'S PIONEER AMERICAN LOCOMOTIVE "TOM THUMB" USED SAWED-OFF SECTIONS OF OLD MUSKET BARRELS FOR TUBES——!

They all use...

Moak Single Spindle Shapers and Speedikut Cutters

TO MAKE FAST-SELLING SHAPED WOOD PRODUCTS

What a combination!

***Moak Single Spindle Shapers*—with speeds up to 12,000 rpm, precision ground table, simple adjustments.**

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Together, they produce rapidly and at low cost the various shapes for furniture, moldings, copings, cabinet-work, sash and paneling that add smart finishing to woodwork.

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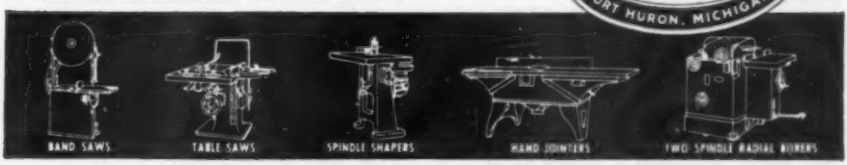
MOAK
PORT HURON, MICHIGAN



to up-to-date information

about equipment and supplies as featured by our advertisers in this particular issue. All of our advertisers will be glad to send information about their products, but we have listed the following firms because they have mentioned booklets in their advertising copy.

ADHESIVES
American Cyanamid Co.—pages 14-15, Booklets.
Perkins Glue Company—pages 70-71, Sample.
Monite Waterproof Glue Company—page 76, Booklet.
National Adhesives—pages 94-95, Sample.
Rohm & Haas Company—page 101, Booklet.
Nelson Company—page 168, Bulletin.
Adhesive Products Corporation—page 189, Sample.

BITS
Forest City Bit & Tool Company—page 46, Catalog.
Greenlee Tool Co.—page 37, Folder.

BORING MACHINES
Oliver Machinery Company—page 1, Bull. 71-D, 71-DX

CLAMPS
Adjustable Clamp Co.—page 105, Catalog.
James L. Taylor Co.—page 104, Catalog.

CUTTERS & KNIVES
Greenlee Tool Co.—page 37, Folder.
Oolite Tool & Engineering Co.—page 75, Folder.
Taylor, Stiles & Co.—page 78, Catalog.
Jones & Orth Company—page 93, Catalog.
Samuel J. Shimer—page 139, Booklet.
Stalter Edge Tool—page 177, Catalog.

DOWEL MACHINES
Hawker Manufacturing Company—page 221, Catalog.

DRILLS & DRILLING ATTACHMENTS
Commander Manufacturing Co.—page 179, Catalog No. 851.

DRY KILNS
Standard Dry Kiln Company—page 7, Catalog.

DUST CONTROL EQUIPMENT
The Day Company—page 98, Bulletin No. 491.
Apex-Detroit—page 158, Catalog 605a.
Kirk & Blum Mfg. Co.—page 223, Booklet.

FACTORY TRUCKS
Jakes Foundry—page 105, Literature.
Towsley Trucks—page 159, Bulletin.
Nutting Truck & Caster Co.—page 188, Literature.

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Beverly Manufacturing Company—page 99, Literature.

HIGH FREQUENCY BONDING EQUIPMENT
Westinghouse Electric Corp.—pages 18-19, Booklet.
Machlett Laboratories, Inc.—page 127, Booklet.
Radio Receptor Company—page 131, Brochure.

HOGS
American Pulverizer Co.—page 69, Literature.

HUMIDIFYING EQUIPMENT
Armstrong Machine Works—page 22, Bulletin.
Bahnson & Company—page 35, Booklet.

JOINTERS
Delta Power Tool Div.—page 63, Catalog.
Northfield Foundry & Machine Co.—pages 112-113, Catalog.

MOISTURE METERS
Kaydel Moisture Gauges—page 184, Catalog No. 335FP.

PLANERS & SURFACERS
Buss Machine Works—page 9, Bulletin No. 61.
Baxter D. Whitney & Son—page 13, Bulletin D12.
Parks Woodworking Machine Co.—page 74, Catalog.
Goodspeed Machine Company—page 100, Bulletin.
Northfield Foundry & Machine Co.—pages 112-113, Catalog.
Powermatic Machine Co.—page 153, Literature.

PLYWOOD PRESSES
V. Berthelsen Engineering Works—page 137, Literature.
Black Brothers Company—Inside Back Cover, Bull. No. 11-P; 11-E; 11-G.
Columbia Machinery & Engineering Corp.—page 125, Bull. No. 5236.
Plycor Company—page 123, Literature.

ROUTERS
Stanley Electric Tools—page 45, Catalog.
Porter-Cable Machine Co.—page 145, Booklet.

SANDING MACHINES & EQUIPMENT
H. B. Smith Co.—page 2, Literature.
Beach Manufacturing Company—page 4, Folder.
Sand-Rite Manufacturing Company—page 179, Circular.

SAW GUIDES
Carter Products Co.—page 145, Catalog.

SAWS & SAW BLADES
Mereen-Johnson Machine Company—page 148, Bull. No. 300.
Big Four Carbide Tool Company—page 32, Booklet
Tannewitz Works—page 100, Circular.
G. M. Diehl Machine Works—page 135, Bull. MRS 1052.
Shopmaster Co.—page 169, Catalog.
L. S. Starrett—page 174, Bulletin "WW."
Heston & Anderson—page 178, Literature.
Moak Machine & Tool Company—page 195, Booklet.
C. O. Porter Machine Co.—page 224, Bulletin 43-20J-1.
Mattison Machine Works—Outside Back Cover, Circulars.

SAW SETTING & SHARPENING EQUIPMENT
Hanchett Mfg. Company—page 97, Bulletin WW-122.
Foley Manufacturing Company—page 192, Booklet.

SCREWS & FASTENERS
Southern Screw Company—page 23, Catalog.
Blake & Johnson—page 103, Catalog.
Clamp Nail Company—page 105, Folder.
New Process Screw Co.—page 107, Catalog.
North Brothers Mfg. Co.—page 146, Booklet.
John Hassall, Inc.—page 168, Sample.

SHAPERS
Greenlee Brothers & Company—page 170, Bull. No. 180-B.

TABLE EQUIPMENT
B. Walter & Co.—page 191, Sample.

TENONERS
Mereen-Johnson Machine Co.—page 148, Bull. No. 400.

VENEER JOINTERS
Veneer Machinery Co.—page 116, Circular.

WOOD WORKING EQUIPMENT
Rudolf Bass—page 185, Catalog.

The Market Place

Rates for Classified Advertisements

Lists of Used and Rebuilt Machinery, either For Sale, Wanted, or For Exchange, set in uniform style, will be published in the Classified Section at the rate of $7.50 for name and address and a five line advertisement. For additional lines, only 75c per line.

DISPLAY ADVERTISEMENTS: 1 inch (Minimum), $8.50; 2 inches, $17.00; 3 inches (Maximum), $25.00.

Write directly to those offering the machine for sale, for prices and full descriptions. If what you seek is not advertised, write Hitchcock Publishing Company, 222 E. Willow Ave., Wheaton, Ill. making known your wants on either new or used machinery and the publisher will gladly assist you.

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THE "HART" LINE

Largest stock of used machinery in America, many ball-bearing, motorized. Substantial savings. Prompt shipment. Write for our list. We equip plants completely. We also buy complete plants or individual machines.

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565 W. Washington Blvd., Chicago 6, Ill.
Phone RAndolph 6-4070

L. R. Kenner
3325 Trinity Road Louisville 6, Ky.

Borer, 4' Bell No. 105 auto. horiz. four heads.
Cut-Off Saw, Buss Cabinet, direct m.d.
Cutter grinder, Mattison No. 231, 98% new.
Dovetailer, Dodds 10-spindle, M.D.
Lathe heads, Mattison hexagon T-slot.
Belt sander, 6' Mattison No. 124 auto. stroke.
Belt sander, Pearson edge moulding, 99% new.
Sander, 42" Yates No. 431 3-dr. end. bed, belt dr.
Woodworker, Sidney universal, five machines.

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MOTORS—GENERATORS—TRANSFORMERS
New and Guaranteed Rebuilt
1 H.P. to 2500 H.P.

ELECTRIC EQUIPMENT CO.
P. O. BOX 51, ROCHESTER 1, N.Y.

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Woodward Machinery Company
309 E. Second St. Cincinnati 2, Ohio

Blower: Garden City 25". $75
Borer: New 16 in. hor. radial, $250
Jointer: Buss 16 in. rd. head, $185
Jointer, Cordesman 8 in. rd. head, $100
Jointer: Smith 12" heavy duty, $250
Lathe: Waymouth automatic variety, $250
Molder: American 8" 4 side, lots of extras, $650
Molder: Smith late rd. head, 6" 4 side, $500
Mortiser: New MD var. light, HC, $100
Planer: Hermance 24x8 Sec. roll MD, $550
Ripsaw: Greenlee self feed, $350.
Sander: C. M. Co. two spindle vertical, $100
Sander: Wysong and Miles No. 171 belt, MD, $250
Saw: F&E No. 330 Variety, $200.
Saw: variety, American tilt. table, $175
Shaper: Whitney MD, B.B., dbl. spdle. $385
Tenoner: Fay with two copes, $250.
Tenoner: Mod. MD BB Famous, 2 copes & cutoff, $750
Veneer clipper: 100 in. Merritt, MD, $800
Wood worker, B. & M. 8 in. Universal, $225

FOR SALE

Clifton Machinery Co.
1023 W. 6th St. Cincinnati, Ohio

Saw Dust and Shavings Mill Exhausters and Blowers—Hundreds in stock, sizes to suit any need. Also Air Compressors, Fans, Rotary Blowers, Money Savers—Send specifications.

All machines rebuilt and fully guaranteed.

NEW 12" B.B. TILTING ARBOR SAW $196.50
NEW 12" and 20" PARKS B.B. PLANERS
WALLACE 8" PEDESTAL TYPE B.B. 4 KNIFE R.H. JOINTER D.M.D., 1 H. 220-3 ....$223.00

AAA SAW & TOOL SERVICE AND SUPPLY COMPANY
1401 W. Washington Blvd. Chicago 7, Ill.

FOR SALE

S. W. Harrington, Inc.

P. O. Box 230 — **Asheville, N. C.**

Air Compressors, various sizes
Air Compressor, Gardner Denver 10x10 Twin dmd.
Band Saw, Cordesman 30" pb. bd. & motor
Band Saw, F & E No. 50—pb. bd.
Band Saw, New Crescent 20" bb. dmd.
Band Saw, New Moak 36" bb. dmd.
Blowers, Sturtevant No. 70 & 48"
Borers, McKnight No. 88 dmd.
Borer, W&M No. 283B Single Spindle Vertical, dmd.
Boring & Sawing, McKnight 26F dmd.
Clamp, Lancaster
Clamp, Taylor, 40 sec. 4 clamps, 7 ft.
Clippers, Coe 88" bd. & motor
Clippers, Sheridan 65" dmd
Dovetailers, Dodds, 20 spindle & 15 spindle
Frequency changers, 30 KW dmd.
Glue jointer, Jenkins No. 343A bb. dmd.
Jointer, Amer. 12" bb. dmd.
Jointer, New Moak 12", bb. dmd.
Lathe, Yates No. 74 bb. dmd.
Mortiser, Sidney, single spindle pb. bd.
Mortiser, Greenlee No. 228 Vert. bd. & motor
Mortiser, W&M No. 288—5 spdle. Horiz. dmd.
Mortiser, W&M No. 284 Single Vertical, bb. dmd.
Moulder, Amer. No. 35—10" bb. dmd.
Moulders, Mattison No. 222, 6" bb., dmd.
Moulders, Vonnegut 12" bb., dmd.
Moulders, Yates-Amer. C-55—9" bb. dmd.
Moulders, Yates-Amer. C-89—6" bb. dmd.
Moulders, F&E 10" pb. bd.
Planers, Berlin 36", rd. hd., dmd.
Planers, New Crescent 24" bb. dmd.
Planer, Whitney 30" Single rd. hd. bb. dmd.
Planer, F&E No. 156 36 x 7 DMD rd. head
Planer-Matcher, Yates A1-15" x 6" rd. hds. pb. bd.
Redrier, Merritt 12 plate 36 x 72
Resaw, Connell & Dengler Circular pd. bd.
Router, Defiance, 2 spindle bb. dmd.
Routers, Carter, floor type, Heavy duty, electric
Router, EC No. 252 bb., dmd.
Saddle Seat, McKnight 1B pb. bd.
Sander, Berlin, 31" 3 drum, roll feed bd.
Sander, Mattison No. 134, pb. bd.
Sanders, Mattison No. 138, hand block bb. dmd.
Sander, New Jefferson, hand block, bb. dmd.
Sanders, Niagara Brush, bb. dmd.
Sander, Smith 49" 3-drum endless bed, bd.
Sander, 48" double disc, dmd.
Sander, W&M No. 171 Hand Block, pb. bd. & Mtr.
Sanders, F & E 60" 3 drum roll feed, dmd.
Sanders, McKnight sgl. drum 24" x 16" dmd.
Sander, Oakley Model G2, bb. dmd. hd. block
Sander, Oakley H2, edge belt, bb. dmd.
Sander, Porter Cable vert. osc. dmd. Sgl. Spdle.
Sander, Yates No. 431, 43" endless bed, dmd.
Saw, Beach double cutoff
Saw, Beach swing cutoff, bb. dmd.
Saw, H&B No. 161, bb. & motor
Saws, Amer. No. 15, bb., dmd.
Saws, DeWalt cutoffs
Saws, Hermance Gang Rip, pb. & motor
Saws, Jenkins 105A dbl. cutoff bb. dmd.
Saws, Mattison No. 207 bb., dmd.
Saws, New Delta-Crescent 12" tilt. arbor. dmd
Saws, New Multiplex, 40A & 50A
Saws, Buss Tilt table Variety bb. dmd.
Saws, Yates Amer. No. 67 bb., dmd.
Shaper, Defiance dbl. spdle., bb. dmd.
Shaper, Whitney No. 389, dbl. bb. dmd.
Shapers, New Moak single spindle, bb. dmd.
Shapers, Greenlee No. 180 dbl. bb. dmd.
Shaper, Whitney double spindle, bb. md.
Sticker, American No. 1, 1 side 4" pb. bd.
Taping machines, Dennis No. 2
Tenon Heads, single & double end.
Tenoner, Hayes 6 ft. dbl. with copes, pb. bd. & mtr.
Veneer Press, Francis 84 x 48
Woodworker, Crescent, pb. bd.

Many other items, send your inquiries.

IMMEDIATE DELIVERY

New Delta 20A-30A-40A-50A Ball Bearing Radial Saws
20" Ball Bearing Band Saw
New Millbury Bench Tenoner, M. D.
New Pedestal Type Duro Router

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Located on B. & O. and Western Maryland Railroads
Write or Call for Prices and Kiln Time

ALLEGHENY LUMBER COMPANY
Elkins, West Virginia
Phone 1368

FOR SALE

Horizontal Boring Machine, Oliver No. 82-D, 2 spindle.
Handy air-powered revolving case clamp No. 402A. Size 48"x27" to open 60"
Dovetailer, Dodds 20 spindle

L. BERMAN & CO., INC.
1125 W. Eichel Ave. Evansville 7, Ind.

FOR SALE

Oliver No. 173 Self Contained Jig Saw
Jones Superior No. 35 Horizontal Double Spindle Borer Maximum 14"
Beach No. 199 Cut-Off Saw
Baxter Whitney 24" Planer, Sq. Hd., Plain Brg.
New Britain Chain Saw Mortiser No. 7
12 Spindle Dodds Dovetailer, Rebuilt
Many Other Items—Send Us Your Inquiries

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1961 EAST MILWAUKEE AVENUE
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Appraisers • Liquidators • Rebuilders

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Wood turning plant located in Massachusetts. Approximately 3 acres of land. Building and equipment for 25 men. Business has been operated over 50 years. Reason for selling—retirement of owner. Willing to sacrifice at low price for quick sale.

Write Box No. 765 c/o
Wood Working Digest,
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New 36" Greenlee Planer No. 110 Single Surface — F.O.B. High Point

Factory Service Man Furnished

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LUMBER CORE COMPANY
HIGH POINT, N. C.

FINEST KILN DRIED GOOD TEXTURED APPALACHIAN HARDWOODS

Red Oak 4/4 to 8/4
Poplar 8/4 to 16/4
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All above high quality lumber uniformly Kiln Dried to below 8% moisture content in the core, offered at very reasonable prices.

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Smith 43" Sander, B.B., M.D.
Mattison No. 124—6' Stroke Sander
Jenkins No. 95 Double End Tenoner
Francis 42" Spreader, M.D.

P. D. WESTMAN
P.O. Box 951 Rockford, Ill.

Drum Sander, Columbia No. 2, 43", 3 drum, 15 H.P. motor, "V" Belt Drive, 3 H.P. Feed Motor, 220 volt: Price $1050.00

Yates No. 255 Power Feed Rip Saw with 15 H.P., 220 volt motor: Price $425.00

JAKOBE LUMBER CO.
Mankato, Minn.

FOR SALE

Andrews Multiple Spindle Boring Machine
Belsaw Gang Rip Saw
10" Walker-Turner Trim Saw
Pearson Sander
24" sawdust or sanddust exhaust blower

MONTICELLO NOVELTY CO., INC.
Flora, Indiana

FOR SALE

Beach No. 1 Double Cut-Off and Mitre Saw. 120"x102" - 2 independent tilting arbor motors - New condition.
Yates-American 36" Band Saw M113 - Direct Connected Motor - Tilt Table - Fully Guarded - Excellent condition.

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Fort Smith, Ark.

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WILL KEEP YOUR
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9" Moulder - Woods No. 131
14" Cut off Saw - Porter C4356
Scarfing Machine - Onsrud Type W142 with frequency changer
Resaw - Mattison Greenlee No. D618
Chain Feed Rip Saw - Mattison No. 207
Gang Rip Saw - Mattison Greenlee No. 426
Shaper - Yates No. 2
Automatic Lathe - Bradley
Band Saw - Mershon 54"
Nailer - Food Machinery, 12 track Type FC

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Syracuse 2, New York
Telephone Syracuse 2-0111

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Mortiser: Crescent mtr. driven late model, 1¾ h.p. motor.
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Hydraulic platen press: 24"x 48" Electrically heated, thermostat controls, priced very low.

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FOR SALE

Mattison Chain-Feed Ripper No. 207
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Hambleton Double End Drilling Machine with motors
Bradley Oval Lathe
Blower
Glover Bolter Model D-JWP with V belt drive and 40 H.P. motor
Fay and Egan Band Saw

Write Box No. 767
c/o Wood Working Digest
Wheaton, Illinois

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500 inches Mattison Wood Turning "T" slot Heads with knives, bolts, and holders.
McKnight Ladder-Rung Tenoner
Double Spindle Oscillating Sander, Table 30x54", Direct M.D.
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No. 20 American H.C. Mortiser

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Oliver Straight Line Rip Saw, new in 1948 .....$2500.00

INDEPENDENT STAVE CO.
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Whatever the reason may be, write, telephone or wire this capable, well equipped organization with skilled workmen. We have complete woodworking facilities including Tenoners, Sticker, Chain Mortiser, Gang Rippers, Cutoff Saws, Band Saws, Shaper, Drill Presses, etc., etc., Equipped for air operations.

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READY FOR IMMEDIATE DELIVERY!!

BORER, Root Style "G-M" Single Spindle Vertical, B.B. M.D.
BORER, Fewsley 2-Spindle Radial Horiz., M.D.
CARVER, Ekstrom-Carlson No. 102 Single Spindle, B.B. M.D.
DOWEL MACHINE, Bell No. 30A Rod Machine, Ballbearing, M.D.
GRINDER, Mattison No. 231 Electric Knife, Motor-in-Head
GRINDER, Covel-Hanchett 36" Model "G-K," two Motor Drive
LATHE, Mattison No. 55-C Auto. B.B., M.D.
MORTISER, New Britain No. 2 Chain Saw Type, Motor Driven
MOULDER, Yates-American No. 3 Six Inch Ballbearing, Motor
SANDER, Wysong & Miles No. 275 Hand Block, Ballbearing, Motor Drive
SANDER, Wysong & Miles No. 277 Hand Block, Ballbearing, Motor Drive
SANDER, Peerless 9-inch No. 6 Vert. B.B., M.D.
SAW, Straight Line Cut-Off, Oliver No. 94, Ballbearing, M.D.
SAW, Straight Line Chain Feed Rip, Mattison No. 207-M, B.B. M.D.
SHAPER, Whitney No. 9 Dbl., B.B., Vert. Mtrs.
SHAPER, Greenlee No. 180 Dbl., B.B., M.D.
VENEER TAPING MACH., Dennis No. 2, M.D.

ALL OFFERINGS SUBJECT TO PRIOR SALE
This is only a partial list—Send us your inquiries

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Phone Fr. 2-8940

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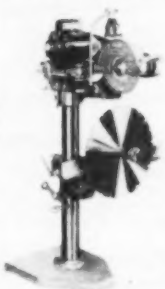

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If you will list below the wood-working machines, supplies or machine shop equipment in which you are interested and mail this page to us, we shall be glad to refer your needs to the manufacturers or others in position to serve you. Replies will come from them — not from us.

If you have any special shop problems let us have the details. Often we can make helpful suggestions.

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NASH Sander 10-spindle, 40" opening, md
SUPERIOR Sander, 1-drum, 48", bd
CURTIS Brush Moulding Sander, md
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CRESCENT 30" Band Saw, BB, DMD
P. B. YATES 36" Band Saw, BB, DMD
OLIVER Pattern Makers Lathe 24"x12' bed
MATTISON 57B Automatic Lathe
YATES-AMERICAN 16" Jointer BB, DMD
OLIVER 30" Single Surfacer, BB, DMD
AMERICAN No. 666 36" Double Surfacer, BB, DMD
YATES No. 213 Glue Jointer, BB, DMD
FALLS Glue Jointer, bd
EKSTROM-CARLSON No. 126 Router, Friction drive
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JENKINS No. 123 16 Spindle Vertical GANG DOOR STILE BORING MACHINE which bores all dowel holes in 11 door stiles per minute, boring alternately right and left stiles.
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FRANCIS 75 Gallon GLUE MIXER & Cooker
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25 SHIMER HEADS for 1⅛, 1⅜, 1¾ Sash Stkg.

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DOIG NAILING MACHINE, brand new, still in original crate.

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FREQUENCY CHANGERS
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15" Yates C-1 Six Head Moulder
15" Yates-Am. No. a-20 Plan & Mat. Dbl. P.
14" Newman No. 500 Plan & Mat Profile
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15" Vance No. 66 Plan & Mat B.B.
15" Yates No. A-4 Plan & Mat Dbl. Profile
10" Woods No. 132 B.B. 5 Head Moulder
6" Vonnegut Elec. Four Side Moulder
30" Smith Endless Bed Sander, 3 Drum
Nash No. 25 Auto. Turning Lathe
Yates-Am. No. A-23 Flooring Mch. All Elec.

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Router, Ekstrom-Carlson No. 434, new condition $1375

Moulder, Fay & Egan 4" pl. bearings, spring pressure feed rolls, 10 HP 3 ph., direct coupled motor. Good condition $950

Tenoner, Crescent, motorized ball brg. machine about 3 years old. Excellent condition $1700

Clamp Carrier, 12 sec. 8" lg. Good condition. $450.00

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Available for immediate delivery the following modern woodworking machines, some still in operation. If you are planning on purchasing new equipment, here is an opportunity to obtain the latest machines at considerable saving.

H. B. Smith No. 404-B 43" endless bed sander
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36-bulb capacity. Six rows of sockets with 6 to a row. Flexible rows stainless steel reflectors 48" x 48" with stands.

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1 Auto Nailer A. C. Motor

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One American 32" Jointer with Jackson & Church Feeding Attachment.
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1 Morgan—6 track
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All in first class condition

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SINGLE MACHINES OR COMPLETE PLANTS—No machine too small or plant too large to interest us. Will pay spot cash. Advise what you have for sale.

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Attractive proposition and lifetime position is offered. Long-established woodworking plant, located in Eastern Pa., specializing in the manufacture of glued-up dimension hardwoods. Requires the services of an experienced superintendent, having a thorough knowledge of all phases of manufacture and the operation of dry kilns.

Write Box 769,
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Wheaton, Illinois

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Used No. 950 J. A. Fay & Egan 30" or 36" Band Saw

L. G. EVANS & CO.
737 S. Western Avenue Chicago 12, Ill.

WANTED

No. 801 or later model Woods Automatic Post Groover

30"—55F with 2 belt Mattison Automatic Lathe or later model

No. 202 or later model Whitney Automatic Shaper

STORKLINE FURNITURE CORP.
4400 West 26th St., Chicago 23, Ill.

WANTED

Nailing Machines, heavy duty, not less than 16 tracks or 50" opening. Must be open back, clinching type. Prefer hardened chucks.

Interested parties contact Mr. P. G. Lobody.

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Successful Eastern Pa. woodworking plant, well financed and specializing in the manufacture of glued-up dimension Northern Hardwoods, desires to merge its operation with a large, efficiently operated woodworking plant presently located close to areas available for maple, birch, and beech species. We can offer a steady, substantial annual volume of profitable work. Many economies can easily be effected through a combination of this type.

If interested, reply to Box 771,
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Fay & Egan Multiple Vert. 12-Spindle
Valley City Two-Spindle Horizontal
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Handy Revolving Carrier
Palmer 6" Wheel Type Clamp Carrier
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Hand Jointers 12" to 30"
Jenkins Saw Type Veneer, B.B., 6' & 8' Clamps

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No. 57-D Mattison 40"
No. T5 Yates Ball Bearing, D.M.D

MOULDERS
XL - 4" x 2" Ball Bearing
Yates C4A Ball Bearing, Belt Drive
6" Vonnegut

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No. 75 American Double
Buss 30", 36", 44" single
Whitney 36" Double
Oliver 30" Ball Bearing Single
Crescent 24" Ball Bear., Dir. Mtr. Dr

ROUTERS
Onsrud W-240

SANDERS
No. 10 Nash 6-Spdle., No. 25 10-spdle.
No. 171 Wysong & Miles Moulding
Yates Three-Drum Endless Bed 43" and 30" coupled motor
43" Smith Ball Bearing, Motor Driven 3-Drum

SAWS
Diehl No. 75 Chain Feed
Yates G-2 Chain Feed
No. 207 Mattison Chain Feed Rip
6' and 7' Buss Hand Feed Double Cut-Off
Wilkin-Challoner Double Cut-Off
Whitney Direct Motor Tilting Arbor
Moak 36" Band Saw
American 36" Band Saw
36" Tannewitz Type GHE

SHAPERS
Porter Double Spindle
No. 200 Porter Single Spindle
Buss and Whitney Double Spindle
N4 Yates-American Single, Ball Bear., Motor Drive

TENONERS
No. 96 Jenkins Ball Bearing, Belt Drive
Fay & Egan Single End
No. 535 Greenlee Saw Type

MISCELLANEOUS
No. 928 Covel-Hanchett Automatic Circular Saw Sharpener
No. 300 Francis Flat Plate Edge Gluer (new)
6, 8 and 12-Plate Merritt Redriers
No. 7 and No. 8 Bell Dowel Drivers and Gluers, motor drive
Wysong & Miles Electric Multiple Horizontal Mortiser
Onsrud S-175 Automatic Shaping Attachment for Onsrud W-240 Router
Sheridan 36" Clipper
Loeffler Toilet Seat Sanders
McKnight Chair Bending Machines
Sheboygan Saddle Seat Machine
50 KW Frequency Changer
75 KW Frequency Changer 60/100 cy.

SPECIALS FOR THIS MONTH

Greenlee No. 386 Multiple 6'—14-Spindle Vertical
No. 276—6" Mattison Ball Bearing, Direct motor Drive

MONICAL MACHINERY COMPANY
240 WEST LEONARD STREET **GRAND RAPIDS 4, MICHIGAN**

Sutton GUARANTEED

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Greenlee 4 ft. vertical gang borer
Amer. No. 2½ Single Spdle. Horiz. Boring Mach.

CLAMPS

Two Handy Revolving Case Clamps
39-Section 8½' Power Operated Billstrom Clamp Carrier—42" opening between jaws
40 Section Taylor Power Operated Clamp Carrier
New Air Operated Frame and Chair Clamps

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10 Spindle Dodds Dovetailer
Dodds 12-Spindle Dovetailer
Wysong & Miles No. 290 Auto. Dovetailing Mach.

GLUE SPREADERS

Black Bros. C-2 Resin 40 Gal. Mixer
New Union Conveyorized Edge Glue Spreader
44" New Black Bros. No. 23-D Double Rubber Roll Resin Glue Spreader
62" Black Dble. Rubber Roll Resin Glue Sprdr.
54" Union Dble. Rubber Roll Resin Glue Spreader

GRINDERS

36" American No. 9 Knife Grinder
Capitol 125" Knife Grinder

HOT PLATE PRESSES

Berthelsen 100x50"
Plycor 80x60"
Plycor 100x50"
Plycor Continuous Feed Lumber Core Machine with Sizing Saw

JOINTERS

Diehl No. 660 Glue Jointer, Direct Motor Drive
Yates-American No. 213 Direct Motor Driven Glue Jointer

LATHES

Mattison 42" No. 57-D motor drive ball bearing
Mattison 36" No. 55-C motor drive ball bearing
Yates-American 30" T-5 Lathe

MORTISERS

Wysong & Miles No. 288 direct motor driven 6-spindle mortiser
Wysong & Miles No. 286 Hinge Seat Mortiser
New Northfield Single Chain Saw Mortiser

MOULDERS

Vonnegut 4" electric Moulder
Yates-American 4" Type C-88 Electric Moulder
Woods 6" No. 132M Electric Moulder
Newman 6" No. 46 Electric Moulder
Newman 12" No. 27 Ball Bearing Belt Driven
Practically new 12" Vonnegut Electric Moulder
Yates 4" C-8A Belt Drive Moulder with motor
Yates-American 10" C-89 Electric Moulder
Hayes Sash & Door Sticker w/Plowing & Boring

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Greenlee 36" No. 116
Yates-American 24" No. 1 Direct Motor Driven Ball Bearing Facer with Four Post Hernog Feed

DOUBLE PLANERS

Yates-American A-20 Electric Planer & Matcher with double profile
Yates-American 30" No. 177 ball bearing, direct motor driven with electric grinder
Whitney 29" and 36" No. 24 direct motor driven, ball bearing, with grinder and jointer

SANDERS

Mattison No. 124 Automatic Stroke Sander
Wysong & Miles 8' No. 294 Automatic Stroke Sander, Direct Motor Driven, Ball Bearing
Pearson Waterfall Sander
Oakley Semi-Automatic Stroke Sander
Oakley Model H drawer Sander
Nash No. 50 and No. 25 Turning Sander
Wysong & Miles No. 275 Belt Sander Direct Motor Drive, Ball Bearing
McKnight Chair Back Post Hard Drum Sander

CUT-OFF SAWS

Wilkin-Challoner Chain Feed Double Cut-Off Saw and Panel Sizer
Yates-American No. 51 Direct Motor Driven Swing Saw
2 Beach Direct Motor Driven Ball Bear. Double Cut-Off Saws & Rip Saws for Sizing lge. Panels

RIP SAWS

New Marion Glue Joint Rip Saw
Mattison No. 207 Direct Motor Driven Ball Bearing Glue Joint Rip Saw
American No. 15 Ball Bearing Chain Feed Rip Saw
Yates-American G-67 Chain Feed Rip Saw

SHAPERS

Whitney No. 251 Double Spindle Electric Shaper
Whitney No. 234 Double Spindle Electric Shaper
Whitney No. 203 Automatic Single Spindle Shaper
Onsrud W-125 Double Spindle Automatic Shaper
Onsrud W125 Single Spindle Automatic Shaper

TENONERS

Jenkins No. 95 Electric, Double-End

VENEER MACHINERY

Francis 76" Hydraulic Veneer Clipper
Dennis Veneer Taping Machine, Motor Driven
100" Merritt Veneer Clipper
Francis Hydraulic Veneer Press 8' by 26', Large quantity irons and clamps, cauls, head blocks, and overhead crane.
Merritt 13 Plate redrier 40 by 86
88" Coe Lathe
88" Coe Clipper and Conveyors

MISCELLANEOUS

Nash Double End Cut-Off & Chucking Machine
Williams Motor Driven No-Knife Hog
Morgan Open Back Clincher Type Nailer
New Raimann Automatic Knot hole borer & plugger
7½ KW Motor Driven Frequency Changer
Stetson-Ross Motor Driven End Matchers—Practically New

Sutton WOODWORKING MACHINE CO.

PHONE 2-4186 **SEDGEFIELD INN** **GREENSBORO, N. C.**

New OR Rebuilt TO NEW STANDARDS

MOTORIZED OR BELT DRIVE MACHINES

BAND SAWS
20"—27"—30"—32"—36"

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Single spindle, horizontal & vertical
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4 spindle vertical—boring area 40"x12"
Andrews Mult. Vert. power feed, boring area 30"x24". Number of heads to suit job
Miscellaneous Borers for various jobs

JOINTERS
8"—12"—16"—20"—24"—30"
30" Jointer & Feeder, B.B., D.M.D.

MOLDERS
Greenlee 8" 4-side B.D.
Woods 9" 4-side B.D.
X-L Moldmatchers, 4" & 6" Electric

MORTISERS
Greenlee No. 228 Vertical, motor
Greenlee horizontal, foot feed
Northfield, vertical, foot feed

PLANERS
Single—12"—16"—20"—26"—30"—42"
American No. 145, 30"x8" Dbl. sect. roll & C.B.
Yates B-2, 30"x8" Dble. sect. roll & C.B., D.M.D.

SANDERS
Amer. 42" & 30" 3-drum, roll feed, M.D
F & E 24" 2-drum, roll feed, M.D.
Oliver No. D-183, belt, M.D.
Hand Block belt—various types

SAWS, VARIETY
Tilting arbors, 5 & 7½ h.p.
Tilting Table, W & W/O Borer
Saw & Dado, foot treadle
Radial Arm, 2—3—5 H.P.
Henry 48" wide Radial Arm, 5 h.p.
Double End, 6' 6", with double end arbors

RIP SAWS
Sinker Davis, self-feed
Mattison No. 202 St. Edge D.M.D. prac. new
Several Hand Feed Saws

SHAPERS
Northfield, single Hi-speed D.M.D
Amer. Sgle. Spindle, heavy duty
Double Spindle—various makes

TENONERS
Single End—Copes & Cut-off

MUST MOVE QUICKLY
1951 MODELS

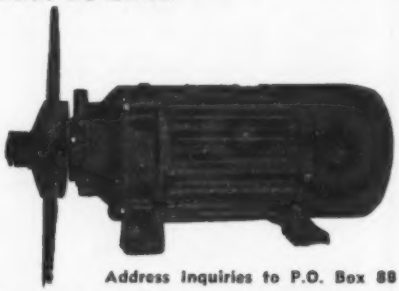
The latest improved machines, all direct motor driven, have had only about sixty days' usage. They must be moved quickly owing to customer liquidating the business. The machines are mentioned briefly — write for details.

BUSS TYPE L 30" SINGLE SURFACER
MATTISON No. 202 STRAIGHT LINE RIP SAW
CARTER GUIDE LIGHT
HENRY 48" RADIAL ARM SAW
NORTHFIELD 16" JOINTER
DELTA 12" TILTING ARBOR SAW
EKSTROM CARLSON NO. 111 EDGE BELT SANDER
AMERICAN 30" JOINTER AND FEEDER

Our stock of about 150 machines of various types and makes enables us to fill your requirements for either belt or motor driven machines, new or rebuilt to new standards. We are briefly listing just a few from our large stock.

SAW ARBOR MOTORS

Totally enclosed, dust proof, fan cooled, ball bearing motors, 3600 R.P.M. From 1 h.p. to 15 h.p. Measures only 3¼" from center of motor shaft to flatted top, facilitating the use of the smallest possible diameter saw blade. 1-2-3-5 horse power motors in stock.
A large stock of Standard Frame 3 phase motors and controls.



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Engineers and Re-Manufacturer

The Osborne and Sexton MACHINERY CO.
COLUMBUS 16, OHIO

"If it's for Woodworking . . . We Have It"

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20" American S. M. Mehry. Co.
16" Delta New
30" Fay & Egan No. 155
32" Crescent M.D. Vee Dr. (New)
30" Tannewitz 7½ hp. D.M.D.
36" Fay & Egan No. 345 and No. 50

BAND RESAWS:
Meahon 44" Vert. Band Resaw
Yates V-4 54" L.H. Vert. M.D
Fisher 40" Vertical
Connell & Dengler 60" $1500.

BORING MACHINES:
American—Clement 2 spindle Hor. Radial Bore
Andrews 72" Ball Br. Vert. Power Feed 8 Spdl.
Fay & Egan No. 312 Vert. 48" cap. 6 Spdl.
Fay & Egan Vert., 6 spindle Borer, 36" Capacity
Root Sgl. Spindle Motor on Spdl.

BOX MAKERS MACHINERY:
Tidey Box Makers Rip Saw
Doig 18 track C.B. Cleater
Doig 3 track C.B. Nailer

CLAMPING MACHINES:
Hayes Power Door Clamp
Lancaster Pneumatic Chair Clamp prac. new ⅓ price
Laidlaw 3½"x8 Door Clamp $250.

CUT OFF SAWS:
Comet T-C-16 10 hp. 44" blade
Greenlee No. 453 C.O. Automatic

DOVE TAIL:
Dodd 15 spdl. M.D. rebuilt like new

DOWEL MACHINES:
Hawker No 2
Hawker No. 3
Fay & Egan No. 406 Rod Machine

JIG SAWS:
Oliver No. 173-B B.B. M.D.
Jones Superior No. 46 Self Contained M.D.
Beach No. 1 Ceiling Suspension

JOINTERS:
Crescent 8" H.D. Ball Br. D.M.D.
Crescent 16" Ball Br. Vee Dr.
Crescent 18" Ball Br. Vee Dr.
Fay & Egan No. 61 24" $275
Moak 12" new D.M.D.
Porter No. 300-C 24" Ball Brg. Jointer, 4 knife head with 10 h.p. 3 ph. D.M.D., used less than 3 months

LATHES:
Mattison No. 55—Automatic

MORTISERS:
American Hor. H.C. Auto Feed
Yates-Amer. No. 25K Motor Spindle
Crescent Ball Br. Motor built in
New Britain No. 4—Chain Mortisers
New Britain No. 3 and 4 Chain Mortiser
Wysong & Miles No. 134 H. C. $200.00

MOULDERS:
Hermance No. 50—12" Babbitted Bearing
American 4" 4 side Moulder P. B.
American 6" No. 3 H.D.
Fay & Egan No. 184 12" P.B.
American No. 505 10" P. B.
S. A. Woods No. 132-M 6" Electric Moulder

NAILING MACHINES:
Doig 18 track Cleater M.D.
Doig 3 track C. B. Nailer
Gramme 4 tr. Cigar Box Nailer

PLANERS—DOUBLE:
American No. 4—27"x7" Double
American No. 6½—27"x7" P.B.
Berlin No. 175 30"x12"

PLANERS—SINGLE:
American No. 4½ 30" x 7"
American No. 444 30" x 7"
Buss No. 208 20"x8" New
Buss No. 248 24"x8" New
Solem 12"x3" D.M.D.
American No. 1 20"x6"
Crescent No. 124 24"x6" P. B
Crescent 26"x8"
American No. 4½—27"x7"
Crescent 26"x8" Var. Feed
American No. 112 24"x8"
Powermatic 12"—16"—20" (New)

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20" - 25" 30" - 35" and 40" Sgl. P.B.

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Comet—¾ h.p., 1 phase (New)
Walker Turner 1½ hp., 3 hp., 3 ph.

RIP SAWS:
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American No. 2 Power Feed
Yates G-2 St. Line Ripper
Yates No. 281 42" Band Rip
Falls St. Line Ball Br. M.D.
Fay & Egan Heavy 10" cap. Hand Feed
L. Power & Co., Self Feed, Belt or Motor

ROUTERS:
Kelley 3 ph. Stair Router
Hunter 1 ph. Stair Router, $50
Duro 1 ph. Floor Type

SANDERS:
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American Col. 48" 3 drum
Amer.-Columbia 42" 3 dr.
Smith 30" 3 dr. Endless Bed Belt Dr.
Mattison No. 115 Variety Belt Sander
Yates-Amer. Comb. 15" Disc and Drum
Beach No. 201 New Belt Sander
American No. 15 24" and 30" Sgl. Drum
Porter Cable Spindle Sander
Fay & Egan No. 225 48" 3 dr.
Wysong & Miles No. 257—Belt Sander
Wysong & Miles No. 171 Belt

SASH MACHINES:
Greenlee No. 604 Sash Relisher
American No. 1 Combination Sash Jointer-Sander

SASH & DOOR MACHINERY
American No. 7 2 side Door Sticker
American No. 3 4" 2 side Sash Sticker, P.B. attach
American Sash DoveTail Machine
American Sash Relisher
Hayes 4 Spl. Stile Boring Machine
American Comb. No. 1 Sash Jointer & Sander

STICKERS:
Hayes 2 side Shimer Heads
American 2 side Door Sticker

SHAPERS:
Fay & Egan No. 253 Sgl. Spl. Ball Br.
American Sgl. Ball Br. M.D.
Fay & Egan No. 265 Double spdl.
Anderson Double Motors on spindles
Delta Floor Type
Walker Turner No. S-1140

TENONERS:
Smith Dbl. End 2 Copes & C. O. Saw Bab. Brg., B.D.
Egan, Sgl., 2 Copes—$275.00
American S. E. No. 5 Copes C.O. Saw
American No. 1 Sgl. w. copes & C.O. Saw
Fay & Egan No. 2 Single w. copes

TIMBER SIZER:
S. A. Woods No. 8, 16" x 30" Sizer
Yates P-12 20"x12" 4 side M.D.

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Tannewitz 42" M.D.
Buss 36 in. bab. brg., V-belt, motor drive.
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Mershon 42" Twin Band Rip, B.B.

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Greenlee No. 371—6' Vert. Gang B.B., D.M.D.
New Wysong & Miles sgl. spdl. Vert. D.M.D.
Greenlee No. 363-6 spindle, Univ. Vert., M.D.

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American No. 80E with 40 h.p. coupled motor.
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Taylor 6-ft. 12-sec. wheel type clamp carrier.

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Black Diamond No. 5 circular saw filer, m.d.

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American No. 1, 24-in. ball-brg. motor drive.
Yates No. 199, 20-in. rd.hd. V-belt m.d.
Porter No. 300 16" Ball Brg. Motor Drive.

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Imperial automatic shaping lathe, b.b. m-d.
Oliver 12" x 6' bed speed lathe, d/c mtr. in head.

MORTISERS
New Britain No. 2 Chain, with motor.
Greenlee No. 227 BM hollow-chisel, DMD
American No. 20 hollow-chisel motor-drive.

MOULDERS
Woods 10" five-head, all electric
Mattison No. 276—6'x4", all electric.
Mattison No. 226—12"x6", all electric
Yates No. 108, 10" belt dr. coupled motor
Woods No. 132-M 6" Electric.
Y-A No. C-99, 12" BB-DMD
Yates No. C-3 4" fast feed, with motor.
Vonnegut 6" B.B.-D.M.D.

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Auto Nailer "Blue Model" M.D.

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Greenlee No. 120-30" Dou. B.B.-D.M.D.
Newman No. 600 24" Sgl. direct motor Dr.
Yates B-2, 36-in. double, motor-drive.
Yates No. 156 20" rd. hd., M.D.
Buss 6A 36" 6-roll single dir. M.D.
Yates No. 177, 30 x 12" double motor drive
American No. 80 15" double, heavy duty
Whitney No. 37-32" Single Ball Brg. M.D.

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Carter Type TR, motor drive 15,000 r.p.m.
Ekstrom-Carlson No. 126, ball brg., motor drive

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Whitney No. 134 double spindle dir. M.D.
Sidney double ball-bearing short belted M.D.
Whitney No. 165 S.S. motor on arbor.
Onsrud, W-248 single, ball bearing
Whitney No. 282 sgl. D.M.D. 50" x 40" table.

SANDERS
Porter-Cable Oscil. spdl. M.D.
Yates-American 842-30" 2 dr. End. Bed. M.D.
Yates No. 421, 49", 6-drum with motors
Solem No. 370, 43" 2-drum End. Bed.
Fay & Egan 30" 3-drum roll feed
Mattison No. 124, 6-ft. auto. stroke, M.D.
Yates-American No. 7, disc and spindle.
Yates No. 431, 43-in., 3-drum end. bed, M.D.

MITRE SAWS
Tannewitz J-250 Tilting Arbor, direct M.D.
American Dbl. revolving arbor, 5 hp belted mtr.
Whitney No. 77 tilting arbor, direct M.D.

CUT-OFF SAWS
Oliver No. 94-D Straight Line, mtr. on arbor
American No. 51 swing saw, motor-drive.
Greenlee No. 451 auto. cut-off and dado
Buss double cabinet type, motor drive
Porter 43-20S 36" stroke, motor on arbor
Irvington "Model" Swing—1 HP Motor

RIP SAWS
G-16 Power Feed, BB, MD
Sinker-Davis No. 13 power gang, 25-h.p. motor.
Greenlee No. 426 Roll Feed with motor

TENONERS
W-C No. 70 jump dado B.B.-D.M.D.
Greenlee No. 534, tilting spindles, dir. M.D.
American single-end with copes, rolling table
Jenkins No. 95 double end, jump dado, D.M.D.

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Jones Superior radial 1" to 16"
Prybill—radial 1" to 16" Sgl. Spdl. Horiz.

DOVETAILERS

Dodds 10, 15, 20 spindle

DOWEL MACHINES

Hawker No. 2 All Ball bearing & roller bearing VBD

JOINTERS

American 12" Wedge Bed BB
American 16" Wedge Bed BB
12" Colloday, L. Powers, H. B. Smith, Crescent, Sidney
Porter 12" DMD
24" Porter DMD with knife grinder

LATHES

Mattison 55C BB Live Tailstock
Mattison 57D Ball Bearing

MORTISERS

Greenlee No. 227 Hollow Chisel DMD Motor Feed
Northfield chisel mortiser, motor driven
Wallace chisel mortiser, motor driven

MOULDERS

Mattison No. 224 9" all electric, hopper fd.
Mattison No. 262 6" Drop Bed DMD
Eaglesfield 6" DMD BB All Electric
Sherrill Timesaver 6" B.B. Belted Mtr. Dr.
Yates C4A 8 x 4 B.D.
Yates C5S 9" DMD All Electric
Yates American, 18" DMD C5S, BB
S.A. Woods No. 131 9", belt driven

PLANERS

Buss No. 4 BB 30" single Sec. Feed & Chip CMD Knife Grinder
Northfield 24" single, MD motor fd. No. 5
Whitney No. 32 36" BB CMD Knife Grinder
Whitney No. 29 40" CMD, BB

PLANER & MATCHER

Fay & Egan No. 156 20"x8" 6 hds., belt dr.

SANDERS

Oakley hand block semi-automatic, mod. D
Peerless 9", 14" and 20" horizontal
Peerless 9", 14" Vertical
Solem No. 370 2 drum, 42"
Vonnegut vertical drum sander
Yates American hand block semi-auto.
Wysong & Miles edge sanders, osc. DMD
Wysong & Miles, Oakley, Mattison belt

SAWS - CUT OFF

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Beach 5 HP DMD BD
Beach Roll Top MD Cap. 102x48
Heston & Anderson No. 5, No. 25 & No. 55
Multiplex 5 HP DMD BB
Unipoint 3 HP DMD BB
Wallace 2 HP DMD BB
DeWalt 1 to 5 HP DMD BB

SAWS - BANDSAWS

36" Towsley DMD
36" American, Tannewitz, Crescent, Oliver
27" Crescent Band Saw
32" Crescent guarded BB VBD
Northfield BB & DMD 20" to 36"

SAWS - RIP SAWS

Diehl BB MD MF No. 75 10 HP
Diehl No. 75 15 HP Motor DMD
Diehl BB No. 77 DMD HP
Hermance Straight Line Plain Bear., BD

SAWS - VARIETY

American Saw Mill 5 HP DMD Tilt Arbor
American No. 10 tilt top belt drive
Greenlee No. 495 DMD tilt arbor
BM Root tilt top belt drive
Northfield Tilt Top DMD
Towsley DMD Tilt Arbor 5 HP
Fay & Egan DMD Tilt Arbor 5 HP
American Sawmill Tilt Arbor DMD 5 HP
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ROUTERS

Onsrud No. 265 1½ HP
Porter No. 612 2 HP & 600

SHAPERS

McCartney BB 1 spindle
L. Powers single BB—MD
Oliver Mod. 287, sgl. spdl. B.D., BB, 5 HP
Union single spindle BB MMBD
Whitney single No. 182

TENONERS

American No. 1 single end belt driven
Fay & Egan single 5 heads CMD
Newman single end BD

MISCELLANEOUS

Electric Carpenter 5 mach. comb. BB, MD
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Fay & Egan No. 316—30" Jointer BB, MD Billstrom Feeder BD

MORTISERS
Greenlee No. 227 BB, MD

MOULDERS
Mattison No. 229-8" Electric, lag bed fd., 25 KVA Freq. Changer
Yates No. C-4-A-8", 20 hp motor

PLANERS
Whitney No. 32-30" Single BB, MD

ROUTERS—SHAPER
Ekstrom, Carlson Combination 2 hp Disc Drive

SANDERS—DRUM
Yates-American No. 433-49" 3-Drum BB, MD

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Porter 43 SL Air Operated (3)

RIPSAWS
Mattison No. 202 Ripsaw

SHAPERS
Buss Double Spindle MD
Whitney No. 395 Double Automatic

TENONERS
Wilkin Challoner 96x72 D. E. Tenoner

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Andrews 60 in. 16-spdl. vert., m-d, power-fd.
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Bell 4-way Hi-Jaw, air-operated.
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Porter, 24" b-b, m-d, rd. hd., Herzog Auto fdr.

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Diehl No. 60 cont. chain-feed, b-b, d.m-d.
Fay & Egan No. 217 continuous chain-feed.
American 12-in. round head, motor-driven
Yates No. 199, 12" round head, motor driven

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American No. 1, 4-in., 4-side, motor-driven
American No. 1, 6-in., 4 side, motor-driven
Eaglesfield 4-in., 4-side all-electric, b-b,
Mattison No. 262, 6-in., 4-side, all-elec., b-b.

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Buss No. 4, 30-in. sgl. m-d.
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Whitney No. 32-40" Single Cabinet, direct motor driven and Ballbearing
Amer. No. 666, 30-in. dbl. cabt., d. m-d. b-b

ROUTERS
Ekstrom-Carlson No. 327 high spd. b-b, d.m.d.
Porter No. 600, High Speed, Ballbearing, d.md.
Porter No. 502, 2-spdl., b-b, d. m-d.

SANDERS
Ekstrom Carlson No. 23 scroll, b-b, d. m-d.
American 42-in. 3-drum, roll-feed, motor-dr.
Smith 43-in., 3-drum endless-bed, dir. m-d.
Amer. No. 2, 24-in. disc and oscillating spdl.
Mattison No. 138 hand block belt, motor-dr.
Delta 6-in. adjustable belt, ball-brg., m-d.
Nash No. 10, 48-in. 6-spdl. auto. turning, m-d.
Pearson edge moulding, ballbrg., dir. m-d.
Curtis No. 64 Auto-stroke, motor driven.

SAWS—CUT-OFF
Buss Double End, Motor Driven.
Bell No. 12-B dbl. mitre & cut-off, b-b, m-d.
Racine floor type, motor-driven.
Bell No. 16 Chip Saw, b-b, m-d. Foot Operated.
Porter C 43, Straight line floor type, direct motor driven, ballbearing

SAWS-RIP
Chicago Hand Feed, Ballbearing, Motor Driven
American No. 15 chain-feed, motor-driven.
Yates G-2 chain feed, motor-dr., ballbrg.
Mattison No. 207M chain feed, b-b, d.m.d.
Eaglesfield chain feed, dir. m-d, b-b.
Hermance Heavy Duty Gang, b-b, d. m-d.

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Sander, auto. stroke, 8', Mattison No. 124, 5 h.p. mtr.
Sander, edge belt, W. & M. No. 315, 3 h.p.
Sander, Dowel Nash No. 4.
Sander, Vonnegut, brush, 1 h.p.
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JOINTERS
Union 6", B.B., D.M.D.
Towsley 10", B.B., D.M.D.
Monk 16", B.B., D.M.D.
Jenkins No. 343A Glue Jointer, B.B., D.M.D.
Porter 24", B.B., Facer with Herzog 4-post Feeder, M.D.
Jackson & Church 16" swing-out Feeder, M.D.

MORTISERS
Sidney Hollow Chisel, B.B., D.M.D.
Greenlee No. 227 Hollow Chisel B.B., D.M.D.
New Britain No. 2 Chain, M.D.

PLANERS
Yates No. 156-30" Single Cabinet, B.B., D.M.D.
Whitney 36" Single Cabinet, B.B., D.M.D.
Whitney 40" Single Cabinet, B.B., D.M.D.

ROUTERS
Onsrud No. 240-D, B.B., M.D.

SANDERS
Solem S3M 42" 3-drum End, Bed, B.B., D.M.D.
Smith 42", 3-drum End, Bed., B.B., D.M.D.
American No. 9, 3-drum, 61" Roll Feed, D.M.D.
Mattison No. 124, 6' Auto. Stroke, M.D.
Mattison No. 138B Hand Block, B.B., M.D.
Jefferson Hand Block, B.B., M.D.
Porter-Cable No. B-3, 10", Belt, B.B., D.M.D.
Mattison No. 172 Edge Belt, M.D.
Fay & Egan 16" Horizontal Belt, M.D.

SAWS
Crescent 36" Band Saw, BB., D.M.D.
American No. 110, 54" Band Resaw, BB, DMD
Porter C-43 Cut-off Saw, B.B., D.M.D.
Diehl No 75 Chain Feed Rip Saw, B.B., D.M.D.
Mattison No. 207 Chain Feed Rip Saw, B.B., D.M.D.
Bell No. 12C Double Mitre Saw, B.B., D.M.D.
Nash No. 4 Double Cut-off & Chuck, B.B., M.D.
Oliver No. 232 Tilt Arbor Saw, B.B., D.M.D.
Bell No. 16, B.B., M.D. (new)

SHAPERS
Crescent No. S-5 Single Spindle, B.B., mtrzd.
Sidney 2-spindle, B.B., motorized
Porter Buck Shaper, B.B., M.D.

MISCELLANEOUS
Morgan 16-track Nailer, open back, with clincher
Mattison No. 55C Automatic Lathe, B.B., M.D.
Jenkins Three-in-One Machine, M.D.
Fay & Egan No. 40IB Double End Crate Tenoner
Jenkins No. 95 Double End Tenoner 48x90" cap.
Dodds 15 spindle Dovetailer, M.D.

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Band Resaw: 54" Mershon with motor
Boring Machine: Greenlee No. 368-4 spindle M.D.
Boring Machines, Vert.: Greenlee & Oliver, M.D.
Cut-Off Saws: Crescent Radial, 5 H.P.
Chucking Machine: Smith, M.D.
Cut-Off Saw: Beach Carriage 6x8'
Cut-Off Saw: Soreins Englesfield, M.D.
Jointer: 8" and 12" Hall & Brown
Jointer: 16" Famous, M.D., 24" Crescent
Jointer: New 8" Delta and Boice Crane 6", H&A
Mortiser, Hollow Chisel: H&B No. 208, M.D.
Moulder: Yates C-3-4"—4 side
Moulder: Yates-American C3A-4", BB
Moulder: American 12"—No. 505—4 side
Nailing Machines: Morgan 8 track open back
Nailing Machines: Morgan 48"—24 track open back
Nailing Machine: 6 and 8 track, closed back
Planer, Thickness: Parks 12", Barton 13"
Planers, Thickness: Delta, Boice-Crane & Powermatic
Planer, Single: 16x6" Powermatic
Planer, Double: Whitney 30x7"—8 Roll, M.D.
Planer, Single: 30x7" American No. 4½
Planer and Matcher: No. 209-15x6 H&B w/Profiler
Routers: Onsrud No. W-240 Y A No. U-900, M.D.
Radial Saws: Delta No. 40C—No. 50C, New
Radial Saw: DeWalt Victory, 5 H.P.
Rip Saw, Roll Feed: XL—10 H.P. motor
Rip Saw, Chain Feed: Diehl No. 55—Y-A, No. G-67
Saddle Seat Machine: McKnight
Sanders, Belt Hand Block: Mattison & Fay & Egan
Sander, Belt Automatic Stroke: Curtis
Sander, Roll Feed: Fay & Egan, 48"—No. 225 MD
Saw Tables: American Double Arbor
Saw Tables: Delta 12"—10", Unisaw 12", Darra James All Tilting Arbor
Shapers, Single Spindle: Fay & Egan, M.D.
Shapers: Delta, Boice-Crane & Crescent
Shapers, Double Spindle: Buss & Whitney, M.D.
Tenoners, Single End: American No. 2½, H&B No. 55
Tenoners, Double End: Wilkins-Challoner, 120" cap. with copes and cut-off
Veneer Press: Francis 24"x96"—15 screws. Available after January 1, 1953
Auto. Lathe: Yates-American T5-30
Dovetailer: Dodds 12 spindle
Electric Moulder: Vonnegut 12"
Shaper, Double Spindle: Whitney, with freq.
Radial Saw: DeWalt, 5 H.P.
Sander, Endless Bed: Yates 49"—3 Drum
Surfacer, Double: Yates 30"x8"

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Hermance Belt Drive Single End Tenoner
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Yates-American No. C-55—12" Ball Bear- ing Electric Moulder
Vonnegut 6" Ball Bearing Electric Moulder
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Pringle & Brodie Single Spindle Borer
Wysong & Miles No. 283-B Single Spindle Borer
Solem S3-M—49" BB Three Drum Endless Bed Sander
Solem No. 370—30" Two Drum Endless Bed Sander
Wm. Loeffler 24" Drum Sander
Jones-Superior No. 145—30" Disc Sander
Buss Double Cut-Off Saw
Tannewitz 42" Ball Bearing Band Saw
Mattison No. 207 Ball Bearing Rip Saw
Whitney No. 24—30" BB Double Head Cabinet Planer
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Loeffler 24" Mtr. Driven Open Drum Sander
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Beach No. 3 Motor Driven Ball Bearing Double Cut Off Saw
Yates-American No. 1 Motor Driven Ball Bearing Variety Saw
Greenlee No. 356 Direct Motor Driven Vert. Single Spindle Borer
Greenlee No. 363 Direct Motor Driven Univ. Spindle Gang Borer
Dodds 15-Spindle Dovetailer, Spiral Gears, attached motor drive
Bell No. 24B Sawing, Boring & Chucking Machine, motor driven
Whitney No. 24—30" Motor Driven Ball Bearing Double Head Surfacer
Yates No. 177—30" M.D., B.B. Double Head Surfacer
Whitney No. 295 Direct Motor Driven Double Spindle Automatic Shaper
Whitney Motor Driven Ball Brg., Dbl. Spd., Shaper with belted motors
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Gallmeyer & Livingston Single Sp.
Minnesota No. 308E 16-Sp. Multiple
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Taylor 7½' 40-Sec. Chain Type
CLAMPS
Handy Case & End Clamps
Handy No. 444 Two-Way Air Clamp
DOVETAILER
Dodds 12-Spindle, spiral gear
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Mattison No. 55C Ball Bearing Auto. Turning
MORTISERS
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Fay & Egan No. 462 P.F. Hollow Chisel
American No. 20 P.F. Hollow Chisel
Sidney F.F. Vertical Hollow Chisel
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Hermance No. 50—8" Ball Bearing
Mattison No. 226, 12" Electric
Smithway "XL" 4" Ball Bearing, M.D.
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Whitney No. 29, 40" Single, Ball Bearing
Buss 30" & 36" Single, M.D.
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SANDERS
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Fay & Egan 48" 3-Dr. Endless Bed
Mattison No. 137 Hand Block Belt Sander
Pearson Model A Moulding Sander
Curtis No. 11 Semi-Auto. Belt Sander
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Diehl No. 55 M.D. Chain Feed Rip
SAWS - CUT-OFF
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Y-A C-44 Floor Type, with Table
Bell No. 12 Double Miter
Root & Beash Double Cut-Off
SAWS - SELF-FEED
Hermance No. 31 Adjustable Roll
Greenlee No. 426 - Root - American
SAW TABLES
Tannewitz SJ Tilting Arbor
American Dbl. Revol. Arbor
Oliver No. 232-D Ball Brg., Tilting Arbor
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Whitney No. 165 D.M.D. Single
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Whitney No. 134 Ball Bearing Double
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• Fay & Egan No. 506—12" hand jointer.
• Yates-American No. 213 glue jointer.
• Jenkins No. 343-A glue jointer.
• Diehl No. 60 glue jointer.

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• Yates-American T-5 auto. turning lathe.

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New Britain Nos. 2 and 7 chain saw mortiser.
• Whitney No. 67 horiz. osc. bit mortiser.

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• Yates-American C-88 6" electric moulder
• Mattison No. 276—6-in. electric moulder.
• Vonnegut 6-in. electric moulder.
• Yates No. 108—10 in. heavy-duty moulder.
• Yates-American C-99 12-in. electric moulder.
Yates CBA-4" belt drive moulder.

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• Whitney 105 24" single planer
• Buss 4-A 30-in. single planer.
• Whitney No. 29—36-in. single planer.
• Whitney No. 24—30-in. and 36-in. double planer.
• Whitney No. 33 32-in. heavy duty double planer.
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Yates No. 481—43-in. 3-Dr. end. bed mtrsd.
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Mattison No. 124 auto. stroke sander.
• Wysong & Miles No. 277 hand block belt sander
Nash No. 10 & No. 25 auto. spindle sanders.

SAWS—Band Scroll & Resaws
• Tannewitz Type G. 36-in. band scroll saw.
• Fay & Egan No. 50—36-in. band saw.
• McDonough 44-in. vertical band resaw.

SAWS—Cut-Off
• Porter 43-298 straight-line cut-off saw
• Yates-American G-44 straight line cut-off saw
• Monarch 36AF radial arm saw.
• Jenkins No. 105-A dbl. cut-off and mitre.
• Bell 12B double cut-off and miter saw.

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• Mattison 202 & 207 straight line ripsaws.
• Yates-American G-77 straight line ripsaw.
• Yates-American G-50 heavy duty ripsaw.
Greenlee No. 426 self feed ripsaw.

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• Fay & Egan No. 500 tilt-table variety saw.
• Baker double arbor variety saw, b.b.

SHAPERS
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• Moak No. 7 single spindle shaper, b-m-d.
• Porter No. 103 single spindle shaper.
• Porter No. 201 double spindle shaper.
• Whitney No. 8 double spindle shaper, b-m-d.
• Greenlee No. 180 double spindle shaper.
• Whitney No. 351 double spindle, 12½ HP motors
• Whitney No. 295 automatic, double spindle shaper
• Onsrud No. 124 automatic single spindle shaper.
• Onsrud WB-85 auto. dbl. spdle. shaper

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• Greenlee No. 530 and 534 single end tenoners, b.b.
• Wilkin-Challoner No. 70 - 96-in. dble. end tenoner
• Jenkins No. 95—96-in. double end tenoner.
Jenkins No. 96 60-in. double end tenoner, b.b.
• Greenlee No. 545—96 inch double end tenoner.

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Dennis No. 2 & No. 4 veneer tapers
Berthelsen 50"x100" two-opening hot plate press.
Francis 36"x84" hyd. veneer presses.
Merritt 84x54—8—10—12 plate redriers.
Jackson 66"x42" veneer lathe

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• Hanchett GK 36-in. auto. knife grinder.
Food Machinery Co. Model AC-2 boxmaker.
• Woods No. 227 side head grinder.
NEW Hanchett No. 133 auto. band resaw sharpener

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• Indicates Ball-Bearing and Motor Driven

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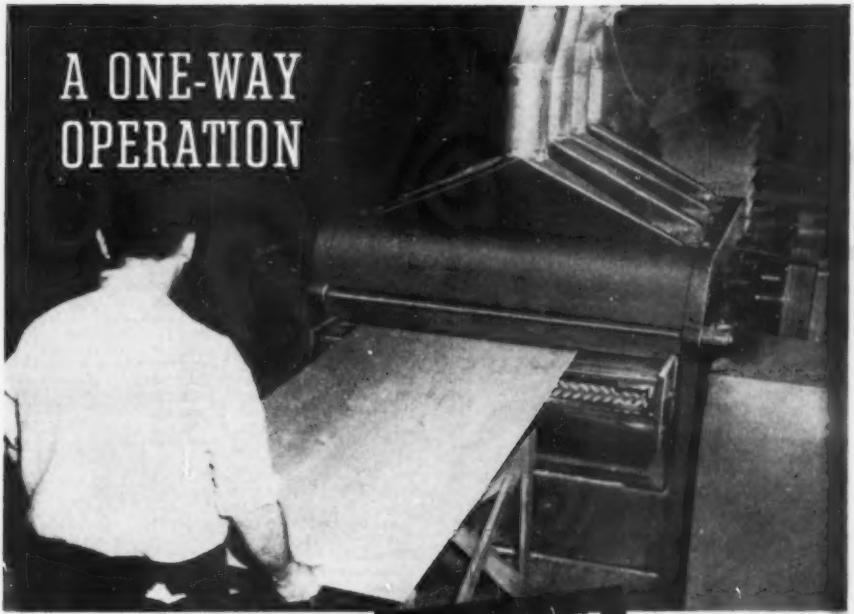

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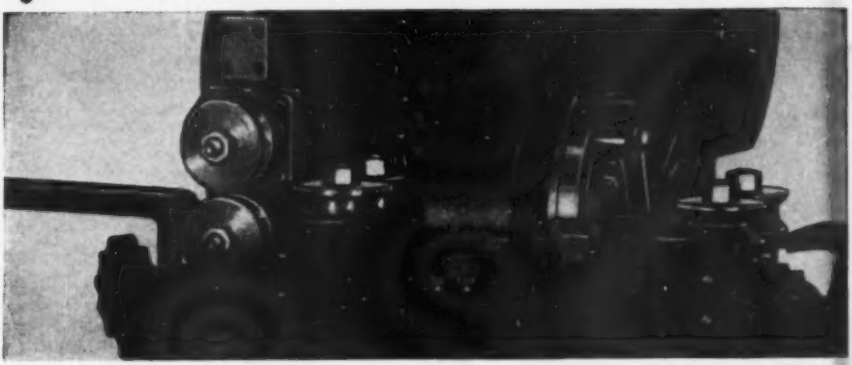

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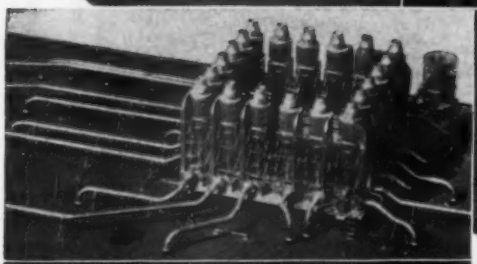

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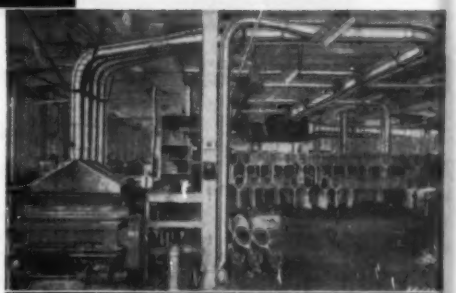

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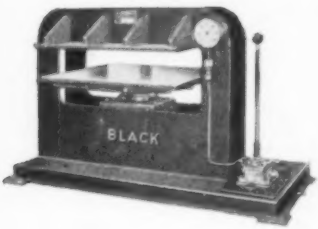

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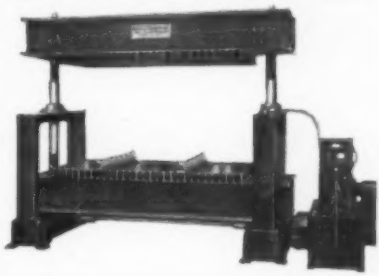

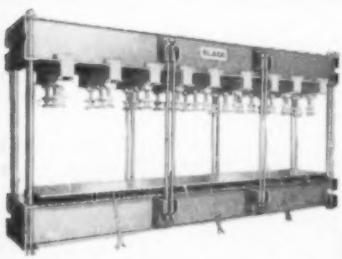

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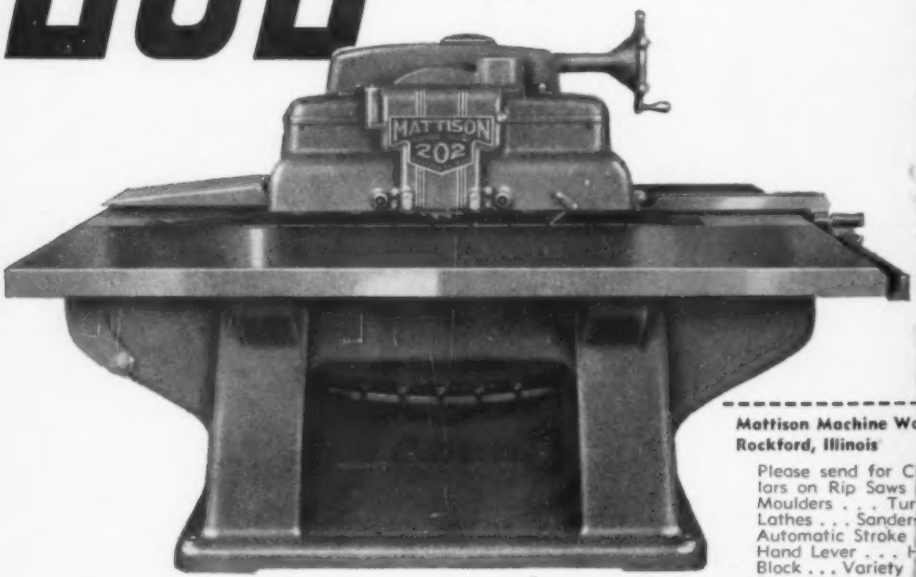

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